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*A Magazine of Practical Surgery in all its branches*

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AMERICAN
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VOL. XXXI. NOVEMBER, 1917. No. 11

# RENAL MISPLACEMENT, RENAL HEMATURIA AND RENAL INFECTION.*

CHARLES H. CHETWOOD, M. D.,
Professor of Genito-Urinary Surgery, New York Polyclinic.
NEW YORK CITY.

I have selected this composite subject on account of the important place that each one of its subdivisions holds in the pathology and treatment of disorders of the kidney, and because of certain interesting phases of each, perhaps less hackneyed than some other renal abnormalities, which afford the opportunity of discussing the interrelationship of these conditions. While material along this particular theme is not lacking, it seems to be quite widely scattered, and with some exceptions, is treated in an unsystematic fashion rather than by concise method. That hematuria, infection or misplacement of the kidney may exist independent of each other, there is not any doubt; and that they may and often do all appear in the one subject, is equally so. Therefore, while one is not essential to the other, and while they do not coexist, just what dependence, if any, one has upon the other is an appropriate topic of discussion in the consideration of the pathology and treatment of disorders of the kidney.

It is not necessary to repeat here what every surgeon knows, the statement of Moullin that all kidneys are movable—physiologically movable—in a vertical plane and this range of movement varies within normal limits, sometimes being even as great as 5 centimeters. The detection of such a degree of mobility, especially of an organ in a long, narrow thorax, might lead to the diagnosis of a pathologically movable kidney, despite the absence of clinical symptoms or of laboratory findings. It is the kidney that is movable in a horizontal plane—in a word, the tilted kidney—that is more apt to give rise to pronounced symptoms for it is an indisputable fact, which will be emphasized here, that movable kidney is a condition that may, on the one hand, give rise to no symptoms whatever, while in other instances, it may be attended by grave phenomena. Furthermore, the severity of the symptoms does not bear a direct ratio to the degree of mobility. There are other factors that may be revealed as the determining influence in the production of active symptoms, directly or indirectly, to be considered later on.

Various causes for undue mobility have been ascribed. A number of observers (Bruce Clark and Glantenay and Gosset) have called attention to the chief cause in the absence of fibrous tissue bands by which the kidney is attached to the back of the abdominal cavity. I have frequently noted, in operating, a total absence of these bands in freely movable kidneys, and the necessity of releasing them for the dislodgment of an immobile kidney. As to the variety of symptoms and their frequency, I find from examination of records of a series of cases of recognized movable kidney that somewhat less than 50 per cent complained of the symptom of pain alone suggesting kidney distension. In over 10 per cent there was evidence of actual obstruction producing stasis in the form of hydronephrosis or pyelitis. In over 5 per cent there was added infection. In 33 per cent there were gastro-intestinal disorders.

The kidney may descend into the iliac fossa when the patient stands upright or coughs, causing merely a feeling of discomfort. On the other hand, it may descend so slightly that it can scarcely be felt by the palpating hand, and yet, on the one hand, its pressure upon the adjacent structures by tilting may cause severe symptoms outside the kidney, which lead to a confusion in diagnosis; or the twisting of a short pedicle may be the cause of marked circulatory disturbance within the kidney.

A kidney that descends behind the peritoneum and fascia that normally form its anterior covering may become hydronephrotic from a kinky ureter; or from repeated bruising it may invite the deposit of tubercle from some other part of the body, the alimentary or pulmonary tract; or it may become the nidus of a calculus. Vertical displacement is not so apt to affect other organs. It is rather the kidney that tilts forward at the top, first described, I believe, by Potain, as anteversion of the kidney, that affects the other organs and causes a variety of symptoms apart from the kidney itself. Therefore the symptoms of misplaced and movable kidneys may be divided into (a) those produced within the organs themselves and (b) those produced in adjacent organs and other parts of the system. We are particularly concerned with the direct influence upon the organs themselves. As phrased by J. B.

* Read before the N. Y. Urological Society, April 11, 1917.

Murphy: "Misplaced kidneys are liable to the same diseases as when located normally. In fact, some authors believe they are unusually predisposed to the various affections." And yet, to iterate the above statement, movable or misplaced kidneys may give rise to no symptom whatever over a long period of time.

The first and most likely local result is *acute congestion* due to torsion of the kidney upon its vessel and upon the ureter, and thereupon follows the sequence of acute hydronephrosis with the symptoms of Dietl's crisis.

A number of personal cases could be cited that have presented that classical train of symptoms expressive of the so-called Dietl's crisis and formerly considered almost conclusive evidence of stone in the kidney or ureter—and that were in reality instances of urinary stasis due to a variety of causes that interfered with pelvic drainage. The literature contains many similar examples.

Dietl's crisis may result from violent exercise, or may come on without apparent cause. The frequency may gradually increase or diminish. In some instances, the kidney remains chronically painful and almost constant dull backache replaces the acute attacks. It is sometimes difficult to gather the true significance of the symptoms until some of the severe attacks are witnessed. In the acute attack the patient is prostrated with sudden, severe pain, and frequently vomiting occurs simultaneously. The urine may become scanty and stained with blood; again, it becomes smoky, resembling the urine of acute Bright's disease; infrequently, marked pyrexia and general constitutional symptoms are noted.

Another result of torsion is the second subdivision of our subject, viz, *hematuria,* transient or more or less permanent in character, depending upon the degree and persistence of the torsion. What a vista of pathological and etiological possibilities does this symptom, hematuria, open up! Apart from neoplasm, stone, tuberculosis, and constitutional renal involvment, with none of which are we here concerned, there is a large number of cases presenting renal hematuria, in which it is most important to gain a clear understanding of the etiological and pathological factors. In attaining this end, it is desirable to have in mind the condition under which hemorrhage occurs in other parts of the body, rather than to individualize too specifically in the explanation of kidney bleeding. A graphic example is the obvious hemorrhage as the principal symptom of rupture of the kidney which needs no explanation. Again attention has been called to the temporary appearance of blood in the urine after palpation of a floating kidney, but apart from this, blood in the urine is not an uncommon symptom in association with mobility of the kidney. It is commonly found microscopically, but rarely enough to impart to the urine its characteristic color. Cases in which there have appeared large quantities of blood have been intermittent in character suggesting a superadded cause. For example, a patient with movable kidney, while moving about in activity, suffers a sensation of fullness on the affected side, and a more or less liberal amount of blood is seen in the urine; the kidney, when examined, is found abnormally low and sensitive. When such a patient is put to bed, there often follows a decrease of blood in the urine and the cessation of attendant tension. Here, then, is a common explanation of renal hematuria, of which one case after another might be cited, namely, interference with the renal circulation, causing congestion, and according to the extent of the latter, tension, ecchymoses, and the microscopic or macroscopic appearance of blood in the urine.

In a word, it may be stated that anything that will cause sufficient tension of the walls of the bloodvessels, will produce a relative amount of renal hemorrhage. Most writers recognize the relationship of mobility of the kidney to hematuria and regard congestion resulting from renal mobility as the sole cause of such hematuria; others, however, insist upon the causative agency of nephritis.

Now, then, assimilating for purposes of discussion, these two main contentions, we will divide the causes of renal hematuria of the class under consideration into extrinsic and intrinsic causes, and tersely summarize all of the variously given extrinsic causes of renal hemorrhage, as all of those causes which directly or indirectly produce renal congestion. The intrinsic causes, in like manner, we must again group, as those causes which will produce renal congestion.

It is unnecessary for us to dwell here upon the many possibilities of interference with the renal circulation extrinsically. I have referred to renal mobility and torsion. We have all of us seen or read of cases that occurred as a result of the pressure of external growths, and of abnormal bloodvessels. In short, they may be summed up as all of those causes that produce obstruction to the blood supply and to the urinary outflow.

Let us now consider concisely the intrinsic causes of renal hemorrhage, which, for purposes of discussion, we must assume may also be dependent upon renal congestion. What, then, may be the sequence of events leading up to and following the period of congestion? We are familiar with the occurrence of hematuria as a result of chemical irri-

tation from the ingestion of certain drugs, such as cantharides, and cannot deny the rôle of congestion here. We have been taught the symptom of hematuria associated with certain constitutional diseases, in the clinical history of which non-pathogenic bacteria and parasites are eliminated by the kidneys, and realize that congestion is the active local condition resulting therefrom.

And this thought directs attention to a most important explanation of many obscure cases of renal hematuria, the third and last subdivision of the topic under present discussion, namely, *renal infection.*

If renal congestion is a step in the direction of renal hemorrhage, is it not also a further step in the direction of renal infection, and renal mobility has, therefore, a relationship to both. A great number of chronic urinary tract infections are associated with a pre-existent bladder condition or kidney ptosis, or both; but, that unilateral nephritis is, as one author states (Haddon, *California State Medical Journal,* Vol. 11, No. 8, 1913) a condition of infection having its origin in a kidney sag, is true in some instances, though by no means in all. The same author expresses the conviction that many movable kidneys are without pathological significance, because the muscle-tone is unimpaired, which is true of the ureter and may well be so with respect to the kidney. When the muscle-tone becomes impaired, there develop urinary stasis and infection. This point has been well brought out by animal experimentation by Barber. (*Jour. A. M. A.,* Jan. 16, 1916.) Every movable kidney, then, is a latent source of trouble, namely, infection, the degree of which depends upon the nature of the latter, and the susceptibility of the tissues. In consideration of the bearing of mobility or displacement of the kidney upon urinary infection it may be stated that bacteriological examination of the urine affords one of the means of diagnosing and classifying pathological floating kidney.

Let us touch briefly upon the bacteriology of the urine in relation to movable kidney, starting with the premise that normal urine is sterile. And yet, by the same token, bacterially infected urine does not necessarily presuppose an existing lesion in the urinary tract, for it is known to be a fact that when bacteria circulate in the blood they are eliminated by the kidneys and they may pass through these organs without leaving their mark behind in the form of an appreciable morbid lesion. What is true of the kidney is true of the bladder. As Cabot states in his exhaustive study of *The Etiology and Pathology of Non-Tuberculosis Renal Infections* (Cabot and Crabtree, *Surgery, Gynecology and Obstetrics,* November, 1916) "Bacteria circulate in the blood and are excreted by the kidney without producing gross lesions; and that they do not do so invariably simply confirms the fact that, in the presence of bacteria, infection of the kidney is determined by certain conditions locally and of the general organism. As it is an inherent function of all parts of the body to resist, and if possible, destroy invading bacterial organisms, likewise, to furnish their expulsion by way of the excretory channels, so it is obviously one of the purposes exerted by the kidney function in default of which there is determined a kidney lesion, and what is termed a lack of resistance on the part of the renal tissues is in part measured by the damage produced by bacterial organisms in transit."

Some of my early cases of renal hematuria of the type that are referred to here, those which were classed, loosely, as idiopathic and essential hematuria were submitted to what now seems a course of doubtful propriety primarily, namely nephrectomy. They afforded, however, an opportunity for laboratory investigation of the existing morbid lesions. In most of the cases hematuria was the sole symptom. Microscopic sections of the kidney showed congestion of both vessels and glomeruli and the characteristic evidences of parenchymatous nephritis. As evidence that this was a one-sided process, some of the cases have been followed over ten years, and two of them, females, gave birth to children during this period, without serious renal complications.

As the outcome of this cursory discussion of three important features of diseases of the kidney, what may be considered their interrelationship, and what practical deduction may be derived as a basis of directing measures of relief?

In the case of movable kidney, if there be no interference with the flow of urine or the passage of blood through the kidney, no symptoms are likely to be produced within the organ itself. Pain is an indication of renal distension. Descent, alone, of the kidney, is by no means sufficient to produce the symptoms growing out of interference with the blood supply or renal outflow. There is usually added the element of torsion or external pressure as a determining cause of symptoms.

Interference with emptying of the pelvis of the kidney, as in the bladder, is a fruitful source or factor of contributory toward infection, or a hindrance to the disappearance of an existing infection. Therefore, whatever impairs the musculature of pelvis or ureter may be considered as a predisposing cause of infection.

Bleeding from the kidney, like that from the other organs, is always due to an impairment of the

continuity of the walls of the bloodvessels, which may be either mechanical (traumatic) or inflammatory (infective).

As evidence of the co-relation of these three phases of kidney disorder are the simple rules upon which the treatment of any one of these conditions, individually or of all of them collectively, may be based.

First: In the case of hemorrhage from the kidney, alone, where there may be either a movable kidney or a movable infected kidney, the indication is for normal and free drainage. This may be attained by fixation and possibly decapsulation. In fixation of the kidney it is important that the question of adequate drainage be considered, for without such provision, urinary stasis may be the forerunner of infection or infection that already exists may not be relieved and hence a failure to control the hematuria may result or a relapse may occur.

Partial or complete decapsulation of the kidney is utilized as an assistance to fixation. Splitting of the organ from pole to pole is undesirable and the ultimate effect upon the kidney unfavorable.

Removal of the kidney that is movable alone, is never to be considered, removal of a mildly infected kidney without suppurative foci is undesirable, and removal of the organ on account of hemorrhage is also to be discountenanced.

The principal demands of operative interference are, as already stated, normal fixation and adequate drainage and the maximum result, it is believed, can be attained when these conditions are properly enforced. When, however, they fail nephrectomy may be necessary; but such a contingency, I believe, is the exception, and is to be contended against as far as possible. In one of my cases the hemorrhage ceased for ten years and then returned. In another, the most recent one, hemorrhage was not controlled by fixation and it is my intention to make a second attempt with a view to obtaining more adequate drainage.

I would finally call attention to the probability that in some instances insidious infection of the renal parenchyma is the underlying cause of renal hemorrhage and failure to discover the former may be due to inaccurate laboratory technic, as is the cause of failure to discover microorganisms in mild bacteremia; and I am firmly of the belief that if the truth is told, in a large percentage of the cases of renal hematuria of nondescript character and undetermined cause an adequate examination of the parenchyma of the kidney would discover the presence of bacterial contamination as the real underlying factor on top of a primary renal congestion.

## THE EMBRYOLOGY OF THE PROSTATE AND ITS RELATION TO THE SURGERY OF OBSTRUCTIVE CONDITIONS.*

OSWALD S. LOWSLEY, M. D.,
NEW YORK CITY.

The human prostate gland begins to develop at the third intrauterine month from five different foci. These foci, as I have shown in a previous communication, originate as solid epithelial outgrowths from the posterior urethra and later from the five lobes of the prostate gland. The solid finger-formed buds later develop lumina which always remain small compared with those of the adult prostate until the great increase in size at puberty. At that time the epithelium, which has previously consisted of cuboidal cells two or three layers thick, become cylindrical in type and one layer in thickness, resting upon a felt-work membrane.

The five groups of tubules from which the gland originates become the five lobes of the prostate, namely: anterior, posterior, right and left lateral and middle lobes. The anterior lobe in early embryonic life is as prominent as other lobes of the prostate, but it usually atrophies about the time of birth. In some cases, as in that of a 17-year-old boy in my series, it remains as large and prominent as any of the other lobes, and there are several instances in which an hypertrophy of the anterior lobe tissue has occurred.

The posterior lobe is always present and is separated from the middle and lateral lobes by a rather firmly knit lamella of connective tissue in which the ejaculatory ducts are embedded.

The two lateral lobes and the middle lobe develop separately, as has been described, but they are not separated from one another by partitions of any sort and from the surgical standpoint their separate origin is of no consequence.

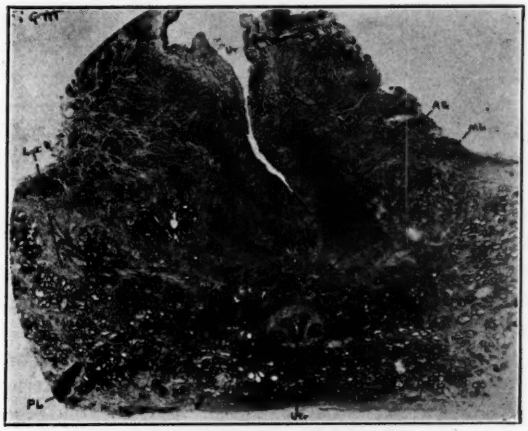
The subcervical group of tubules described in detail by me begins to develop at the fourth intrauterine month and these become of considerable consequence, due to the fact that they grow back just under the mucosa of the urethra and within the sphincter and, as my studies have shown, they become enlarged in almost 25 per cent of men over 30 years of age. They form several types of tumors at the floor of the vesical orifice; the single tumors of varying sizes, the partially divided tumors and those divided into three portions. This condition occurs probably because of the continual pressure exerted

* Read before New York Branch of the American Urological Association, December 6, 1916.

by the action of the so-called Bell's muscles during each urinary act.

The anatomical arrangement of the different portions of the prostate are of the utmost importance in the various surgical procedures in attacking pathological conditions of the prostate.

In complete resection of the prostate for carcinoma the seminal vesicles in their entirety must be removed at the same time. The reason for this is that carcinoma, when primary, usually begins to develop in the posterior lobe and there is quite free communication of the vascular and lymphatic elements between the posterior lobe of the prostate and the seminal vesicles. In carcinoma of the prostate the rectum is involved late and high up, due to the pressure of the thick leathery fascia of Denonvilliers, which is a reflection of the peritoneum which



Fg. I. Cross section at the level of the region just above the upper end of the verumontanum of a man 34 years of age (section cut slightly obliquely) Ur., Urethra and portion of bladder lumen. AG. Albarrans glandular tubules., ML. Middle lobe tubules., Lat., Lateral lobe tubules. PL., Posterior lobe tubules. Utr., Utriculus prostaticus and ejaculatory ducts bound firmly together in envelope.

extends to the apex of the prostate in fetal life and later becomes closed off from the main peritoneal cavity. It is also due to the presence of the triple-layered intravesicular fascia which binds the seminal vesicles to each other and causes dissemination from this source to be considerably delayed. The fact that the seminal vesicles are so closely bound to the prostate and so well isolated from surrounding structures by the various envelopes mentioned compels the surgeon to remove the entire structure when there is a question of operable carcinoma.

There are several important anatomical points to be borne in mind by the surgeon performing Young's perineal prostatectomy. In dissecting down upon the prostate the recto-urethralis muscle, a small ribbon-like muscular structure attaching the apex of the prostate to the rectal wall must be divided, otherwise there is danger of tearing through the wall of the rectum into the viscus. One recognizes the posterior surface of the prostate upon separating the levator ani muscle by the glistening fascia of Denonvilliers, which clings tightly to the posterior surface of the prostate.

In order to penetrate the lateral and middle lobe areas, the portions in which the hypertrophy occurs, one must make the lateral incisions entirely through the lamella of tissue which separates the posterior from the two lateral lobes. If these incisions are not made deep enough, the enucleating finger or instrument will infringe on the proximal surface of the lamella and the enucleating instrument will be lead to the lateral capsule of the prostate, where great damage will be done if force is used, because of the fact that the capsule contains many large bloodvessels which, if ruptured, may add materially to the hemorrhage resulting from the operation.

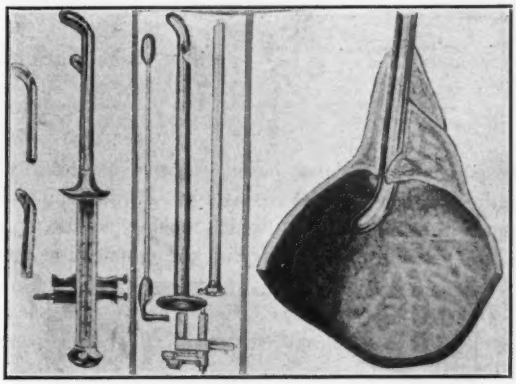


Fig. II. Young's Instrument in Operation (Randall).

The enlarged middle and lateral portions of the prostate are removed through the two lateral incisions leaving the ejaculatory ducts unbound in the bridge of tissue between the two incisions. The cavities are easily and effectually packed with gauze and this may help materially to diminish hemorrhage. There is only one objection to perineal prostatectomy and that is that there must be an especial effort made to examine for and remove any enlarged subcervical group at the vesical orifice. Sometimes the removal of this structure is very difficult and I have seen three cases where it was necessary to perform suprapubic cystotomy in order to accomplish this.

The perineal prostatectomy is more difficult to perform, requires somewhat complete knowledge of the anatomy of the perineum and great care in observing the points just set forth. It has the advantage of an operation performed under sight, an opportunity to pack thoroughly the cavities from

which the enlarged lobes of the prostate have been removed, and very much better drainage.

In the suprapubic operation the intraurethral enucleation follows more closely the anatomical structures involved than does the procedure recommended by Freyer, viz, making an incision into the most prominent part of the gland and commencing

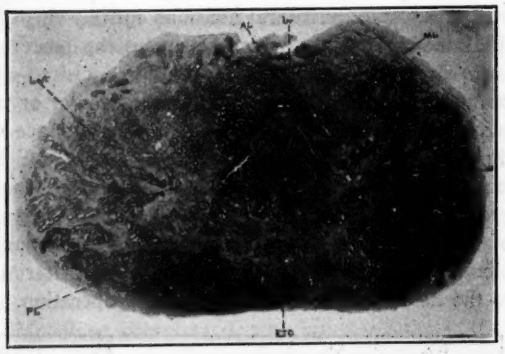


Fig. III. Cross section through the level of the upper end of verumontanum in a boy 17 yrs. UR. Urethra. ML. Middle lobe tubules. Lat. Lateral lobe tubules. PL. Post. lobe. tubules showing above a fairly well marked partition between lat. and post. lobes. AL. Anterior lobe tubules. UTR. Utriculus prostaticus. EJD. Ejaculatory ducts.

the enucleation at that point. In the intraurethral method which simply consists in introducing the finger into the urethra, which usually splits in a ventral direction, and carrying the enucleation lat-

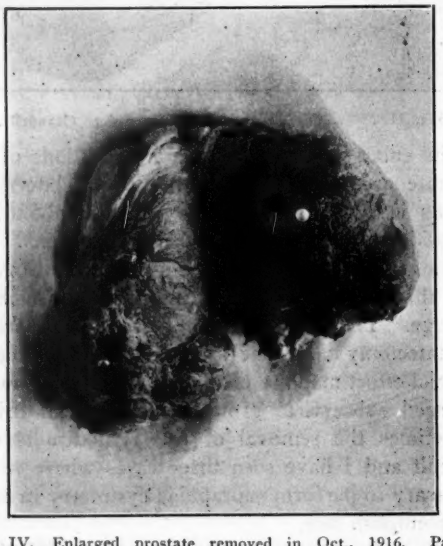


Fig. IV. Enlarged prostate removed in Oct., 1916. Patient died from uraemia 10 days later.

erally in both directions commencing at the top of the involved structure on either side until it is entirely free. This removes the lateral and middle lobes and the subcervical group all in one mass and does not damage the sphincteric ring as happens in the procedure of Freyer.

I have examined a great many specimens removed by the suprapubic route and find that practically all of them have carried away with them the very uppermost portion of the verumontanum down to but never including the ejaculatory ducts. The

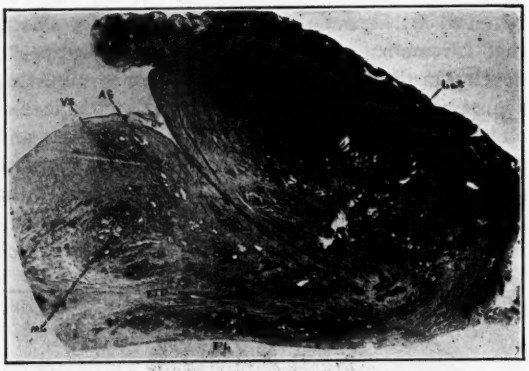


Fig. V. Oblique section through the prostate and trigonal region of a man aged 76 years. UR., Urethra. AG. Subcervical gland tubules. VS., Vesical sphincter. ML. Middle lobe tubules. EJD. Ejaculatory ducts and muscular envelope. PL. Posterior lobe tubules. Lat. Lateral lobe tubules.

reason for this is that the ejaculatory ducts are imbedded in the lamella of tissues separating the posterior lobe from the rest of the prostate and hence cannot be removed without a special cutting operation done with this particular purpose in view.

The disadvantages by the suprapubic operation

Fig. VI. Cavity from which accompanying prostate was removed showing remarkable manner in which the cavity reduces in size due to the contractility of the prostatic capsule.

done by any method are: the poor uphill drainage; the fact that it is a blind operation; and the greater hemorrhage due to the necessary laceration of the very vascular trigonum and vesical orifice and the difficulty in properly packing the prostatic cavity. Following the suggestion of David W. MacKenzie,

of Magill University, before closing up the incision in the bladder after the suprapubic operation I always put the patient in Trendelenburg position and with wide retraction examine the bed of the prostate and clamp and ligate any bleeding vessels observed. Hemorrhage is very much less and the loss of a patient from that cause is almost impossible because any severe bleeding can be curbed at once.

The advantages of the suprapubic operation are the simplicity of the procedure and the rapidity with which the operation can be performed.

The subcervical group of tubules occupies an extremely strategic position within the sphincter on the floor of the vesical orifice. As its size increases, with accompanying evils, the obstructions become

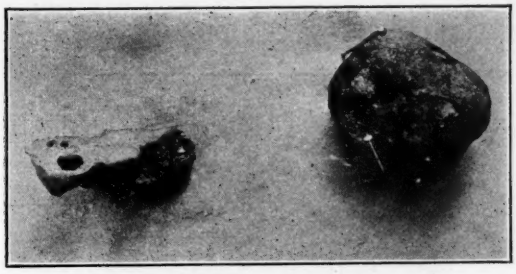


Fig. VII. Moderate enlargement of the subcervical group and a large stone formed in the bladder from the resulting retention. Removed by the author in March, 1916.

marked and should be removed. A great many procedures have been recommended. I have found that Young's punch operation is decidedly the best method employed in removing these intrasphincteric masses, be they very small, large, unilobular, or trilobular. The instrument is introduced so that the window is in the posterior urethra. The obdurator is withdrawn and the instrument inserted still further until the tumor at the vesical orifice rises into the fenestra completely filling it. The cutting inner tube is then introduced and quickly pushed into position, punching out the entire portion of the tumor in the fenestra. The instrument is then turned obliquely to the right and then to the left, where the same procedure is repeated. It is then withdrawn and a catheter with a large fenestra is introduced. It is wise to keep a small amount of fluid in the bladder continually, but the former practice of keeping up the continuous irrigation has been given up, as it seemed to delay the clotting of the blood at the cut surfaces and hence delayed the healing. As a rule the bleeding stops after a few hours and the catheter can often be removed after 24 or 36 hours.

An enlargement of the subcervical group is of such frequent occurrence that digital examination should always be made when a patient is operated upon for enlargement of the prostate by the perineal route. A patient recently came to me with 14 ounces residual urine one year after perineal prostatectomy. He was able to void about 6 ounces of urine and was obliged to pass his urine every hour and a half during the night as well as during the day. The act of micturition was an extremely painful process and consisted of a forceless dribble. Cystoscopic examination demonstrated an enlargement of the subcervical group which had been left behind.

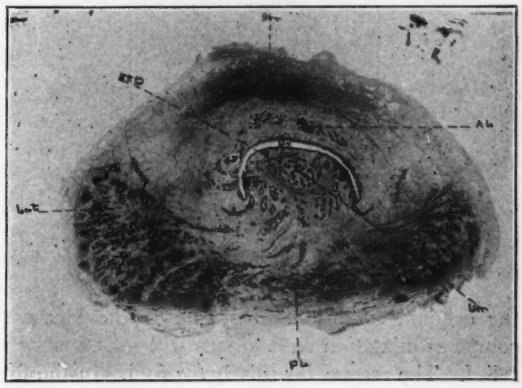


Fig. VIII.

Young's punch operation was performed with 4 per cent novocain. After the usual amount of hemorrhage had ceased the tube was removed and the patient's convalescence was rapid and uneventful. The result, six months after operation is very satisfactory. The patient is now able to void a forceful stream without pain or hesitancy, rarely has to get up at night to urinate and has less than one ounce of residual urine. This particular case typifies many others that have come under my observation and teaches that no prostatectomy is well done unless one searches for a subcervical gland enlargement at the time of operation.

Suprapubic prostatectomy as practiced by Squier will remove the subcervical group of glands in the natural course of the operation.

The same influences which cause the subcervical gland to enlarge apparently cause prostatic hypertrophy later on, so the punch operation may need to be followed years after by a prostatectomy. It seems advisable, however, to do this operation on every case which presents symptoms and has any considerable amount of residual urine.

These tumors have been treated by Bugbee, Stevens and others by the high frequency current. Chetwood's modification of the Bettini operation is

also preferred by some operators. The reason why the Young punch operation seems to be the one of choice in this condition is that the entire tumor is removed at one time without injury to the internal sphincter and without general anesthesia.

Hypertrophic changes in the musculature of the trigonum vesicae, as it passes over the floor of the vesical orifice, is best treated by Young's punch or Chetwood's electro-cautery method. The high frequency spark is of very doubtful benefit, as the resulting scar would be nearly as hard to deal with as

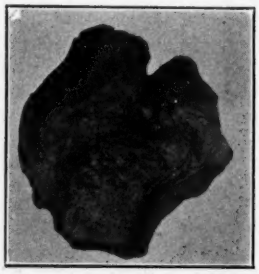


Fig. IX. Hypertrophy of subcervical group in three distinct portions which practically block the urethra.

the original condition. In some of these cases a course of dilatation with sounds will sometimes give relief. The reason for this is twofold. In the first place the hypertrophy often occurs because of stricture of the urethra and the passage of sounds relieves the causative element. Second, there is a great amount of inflammatory tissue present as a

Fig. X. Trilobe enlargement of subcervical group which marked signs of obstruction.

rule which is largely dispelled by the passage of sounds. Often the action can be hastened by digital massage by rectum in the region of the vesical orifice with the sound in the urethra.

Tumors of the subtrigonal group if not too large may be removed by Young's intravesicular rongeur. This is an exceedingly valuable instrument, but it must be used with care and intelligence, as it is so powerful that if used recklessly there is a possibility of lacerating the vesical wall. It has the advantage of sufficient strength and size to enable the operator to excise a large tumor without the use of a general anesthetic. Buerger's operating cystoscope can be utilized if the tumor is very small. High frequency has a distinct value in some of these cases, especially if the tumor is pedunculated. If the growth is large and sessile it is sometimes necessary, as it was in one case that I saw in Young's clinic, to perform a cystotomy and excise the mass with a scalpel.

Cases of fibrous stricture of the vesical orifice are treated best by Chetwood's electro-cautery and Young's punch. Were it not for the fact that an anesthetic is required for the former it would be decidedly the operation of choice. I have in my series a case treated by Chetwood's method with a perfect result. The criticism that there is danger of burning into the rectum is not justified, since the distance from the vesical orifice through the prostate to its posterior surface is in all of my specimens

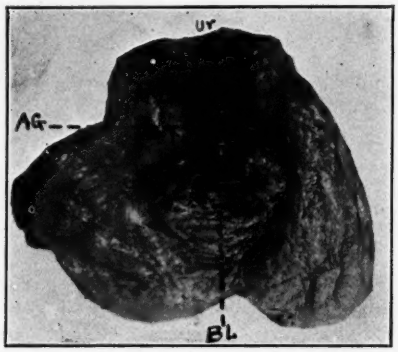



Fig. XI. Specimen showing marked hypertrophy of subcervical group in three distinct portions which are very large and almost completely block the urethra. BL. Fundus of bladder showing marked signs of obstruction. AG. Subcervical glands divided into three portions. UR. Urethra at apex of prostate.

an inch or more. This operation burns through the internal sphincter and, in healing, it apparently does not permit that structure to resume its physiological action. Incontinence does not occur, however, if the external sphincter is not injured in performing the external urethrotomy to introduce the instrument. Young's punch is used in these cases, but is not quite so radical and must be followed by the passage of sounds occasionally.

Cysts at the vesical orifice are best treated by the high frequency current. One application of the spark is usually all that is required to eradicate the delicate wall. The Buerger operating instrument in a McCarthy cysto-urethroscope can also be used successfully in this condition. Often cysts in this region arise from a portion of the subcervical group in which case the remainder of the enlargement must be treated as well, although the cystic portion

is usually the cause of the major portion of the obstructing mass.

CONCLUSIONS.—(1) An understanding of the embryology and morphology of the prostate is essential for its prosper surgical treatment by any method.

(a) In Young's perineal operation it is essential to make the incision entirely through the posterior lobe into the lateral lobe cavities before beginning the enucleation, otherwise the instrument will be led into the capsule of the gland and proper separation cannot be accomplished.

(b) The intraurethral suprapubic type of operation is preferable to the method advocated by Freyer on account of the fact that in the former there is less derangement of the anatomical structure.

(2) The posterior lobe of the prostate is never removed by either the Young's perineal method or by the suprapubic route.

(3) The ejaculatory ducts in practically every instance are not removed in a prostatectomy on account of the fact that they are firmly attached to the lamella of connective tissue which separates the posterior lobe from the rest of the prostate. In the suprapubic operation the upper portion of the verumontanum is usually torn way down to the point of entrance of the ejaculatory ducts, but on account of their structural qualities the orifices themselves are usually uninjured.

(4) The comparatively late and high infection of the rectum in carcinoma of the prostate is due to the presence of the fascia of Denonvilliers and the intravesicular fascia.

(5) The subcervical group enlargements are of frequent occurrence and of great importance on account of the strategic position which they occupy. Excision is best done by Young's punch or a suprapubic cystotomy, although the high frequency current and Chetwood's galvano-cautery method are advocated by some adherents.

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## NON-REMOVAL OF THE PECTORAL MUSCLE IN BREAST CANCER

There are certain occasions when one is tempted to do the incomplete operation, particularly in cases of early cancer possibly demonstrable only by exploratory incision or by means of a frozen section, when the cancer is small, movable and situated some distance from the pectoral fascia, when there is no appreciable involvement of the axillary lymph nodes, and particularly upon the urgent request of the patient who dreads the mutilation of a breast amputation. In spite of what has been known for years concerning the involvement of the pectoral muscle, and the high mortality which attends metastasis to this situation, a few surgeons spare the muscle because they fear edema and loss of motion of the arm. That this is an unnecessary dread is appreciated by those who follow the technic of the modern operations such as is described by Dr. W. L. Rodman. I have never seen permanent edema of the arm develop after this operation, and the amount of motion of the arm has always been satisfactory. —JOHN SPEESE in *The Pennsylvania Medical Journal.*

# CHOLECYSTECTOMY: INDICATIONS AND TECHNIQUE.

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*Indications.*—Cholecystectomy is indicated in all diseases of the gall-bladder, whether causing mild or severe symptoms. The operation is not done for the purpose of removing stones, for these may or may not be present, but for the purpose of removing tissue diseased as a result of progressive inflammation. Whether gall stones are present or not is immaterial for they are but one of the ways in which an already existant inflammation expresses itself.

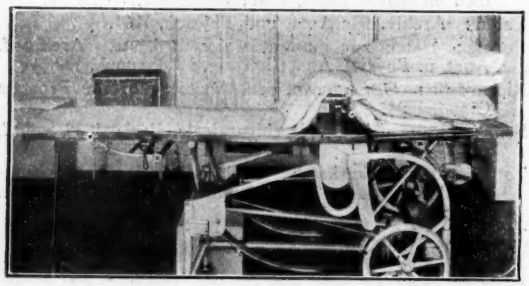

Fig. 1. Author's table prepared for operation on gall-bladder.

Aschoff believes that pure cholesterin stones can be formed without any symptoms whatever. Such stones are called latent or innocent. Personally I believe there is no such thing as innocent gall stones, but that they are the product of inflammation; that a gall-bladder once infected is always infected, and such a gall-bladder may become at any time a source of real danger to the patient through either the acute exacerbation of the inflammation or a change to carcinoma during middle or later life. In the latter connection are to be noted the operations upon carcinomatous gall-bladder, proven microscopically, occurring only in association with chronic cholecystitis, in which the operation has been performed a few months too late to be of value to the patient, the disease having already extended beyond the gall-bladder and involved the liver.

Whenever possible cholecystectomy should be performed early not only for the reasons stated, but also because inflammations of the gall-bladder are for the most part, probably always *recurrent and progressive* and if the inflammation is allowed to follow its natural trend at the very least there results adhesions which in their turn produce annoying and in many instances disabling symptoms. Early cholecystectomy is therefore advised whether the symptoms produced are mild or otherwise. So many operations have been performed on the terminal pathology of this condition with an attendant high mortality and disability from already existing complications that it is time for early operation to be advocated, because early operation at a time when the disease is *limited to the gall-bladder* means at the very least the saving of much discomfort and inefficiency later in life. At all events, the patient should be given an opportunity to choose the early stages of the disease whether he wishes to continue to be subject to recurring attacks of so-called indigestion with the added dangers of acute inflammation and the final danger of carcinomatous change.

Medical measures with the idea of causing the passage of the stones are very ill-advised; fortunately, they are not apt to be successful. If stones

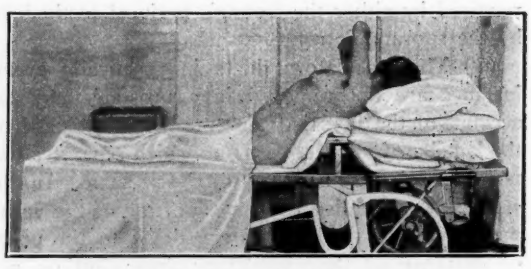

Fig. 2. Position for gall-bladder operation.

do pass they can but serve to cause an extension of the disease beyond the gall-bladder. Formerly the high mortality of operations in this region was thought to be a bar to operative interference except in advanced cases; it is these very cases which are responsible for the high mortality; the disease should not be allowed to progress to this point. The lesion is initiated in the gall-bladder and early removal of the gall-bladder will prevent the complications above stated, and also will be attended with an extremely low mortality. This mortality should be no higher than that attendant upon operations for chronic appendicitis. Personally I have never had a death from an operation upon the gall-bladder where the disease was limited to the gall-bladder itself. The cases that have succumbed have been those in which carcinoma was present or in which the disease had extended to the common and hepatic ducts or in which there was gangrenous inflammation and perforation.

At the operating table there are certain cases in which the indication for operative attack upon the gall-bladder can be determined only by one who has had extensive experience in this department of surgery. This does not refer to those gall-bladders

presenting indubitable evidences of inflammation such as may be recognized by all. Such inflamed gall-bladders should be removed. It is also to be noted that it is not sufficient to remove the gall-bladder, but that exploration of the ducts is imperative if one wishes to be free from the annoyance of so-called recurrences. When the common duct has once been infected by inflammation there is always the possibility that further stones will form. Three times I have opened the common duct of the same patient at intervals of one and four years and removed a stone. I do not believe that I overlooked a stone at any one of these times, but that a stone had been formed between the operations, this due to the diseased condition of the duct itself. Other times I have opened a duct a second time after a primary exploration had failed to disclose a stone and found one. This further strengthens the position that the disease should be attacked while still limited to the gall-bladder. In exploring the common duct it is not sufficient to pass a probe through it through the stump of the widened cystic duct. The duct must be opened. Several times after passing a probe freely into the duodenum I have at the same operation opened the duct and found several small stones. In one instance, after most thorough exploration, stones, evidently from the hepatic ducts, came out through the wound several days later.

Fig. 3. The position renders the gall-bladder and ducts readily accessible.

In addition to the marked evidences of inflammation there are certain diagnostic signs which can be relied upon even when the gall-bladder itself looks normal. There are the enlargement of the gland in relation with the cystic duct, enlarged glands at the base of the liver and enlarged glands along the common duct itself, including those glands in the pancreas at the termination of the common duct in the duodenal wall. When only the gland in relation with the cystic duct is enlarged it may usually be relied upon that the disease has not extended beyond the gall-bladder itself and when this gland is found enlarged cholecystectomy is indicated even if the external appearance of the gall-bladder is apparently normal.

The enlargement of the other glands mentioned is further corroboration of gall-bladder disease, but also may indicate that the disease has progressed beyond the gall-bladder, though not necessarily the latter.

Adhesions, however slight, of the gall-bladder to the duodenum or to the colon or to the stomach, are indications of cholecystectomy. This paper is not dealing with symptoms, but it may be noted in passing that often slight adhesions between the cystic duct, the infundibulum of the gall-bladder and duodenum in the absence of stone have been observed to produce as agonizing symptoms as if stone were present.

Fig. 4. Evacuating the gall-bladder contents.

In palpating a gall-bladder in which disease is suspected it may be that it will be found tense, distended and apparently without stones. It is inadvisable to press such a gall-bladder with the idea of expressing its contents through the cystic duct, for by so doing small stones may be forced into the common and hepatic ducts. It is much better to introduce an aspirating needle attached to a suction apparatus and withdraw the fluid. Many times by so doing stones have been discovered or a thickening of the gall-bladder wall which it was impossible to discover by palpation in the distended state of the viscus.

In such cases (distended gall-bladders) if the clinical symptoms point to gall-bladder disease it is not sufficient to palpate through an incision at a distance from the gall-bladder, but it must itself be exposed and viewed as well as palpated, and if necessary aspirated.

The aspirated contents of the gall-bladder are of positive but not of negative value in determining

whether the viscus is diseased. Normal bile is thin and amber-colored. Any deviation from this is suggestive of an infected gall-bladder or interference with proper drainage or both. As examples of the latter may be cited dirty looking bile and tarry bile. If interference with drainage exists, either through incomplete obstruction of the cystic duct or through impairment of the musculature of the gall-bladder wall by inflammatory infiltration, making it impossible for the viscus to empty readily, there results a stringiness or excessive stickiness of the aspirated bile due to an excess of mucus produced by irritation through infection of the mucous glands. In case of complete blockage of the cystic duct of long standing very thick glairy mucus is present; when the blockage is of very long standing the fluid

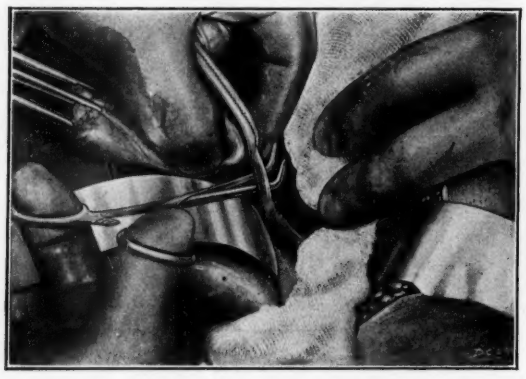

Fig. 5. Isolating the cystic duct.

Fig. 6. Section of the cystic duct.

will be watery and limpid or milky. At times masses of cholesterin crystals visible to the naked eye, but not large enough to be dignified by the name of stone, are seen in bile long contained in the gall-bladder.

In acute complete blockage the fluid is inflammatory, purulent or bloody; the first portion of the aspiration may look somewhat like normal bile, but as the more dependent part is withdrawn it will prove cloudy, bloody or purulent, with more or less detritus.

*Technic.*—Cholecystectomy should be just as formal an operation as hysterectomy or thyroidectomy.

The technique which is here described has been employed by me for a number of years and in a sufficient number of cases of all degrees of pathological change to satisfy me of its adequacy. No originality is claimed. The method is the logical result of a practical study of the anatomical and pathological conditions present in gall-bladder disease. The basis of each illustration has been selected from moving-picture film.

*Anesthesia.*—When operating upon these cases I often state that 50 per cent of the success of the operation is due to the anesthesia, 40 per cent to the position, 9 per cent to the assistants and the remainder to the operator. This is done to emphasize the value of proper anesthesia and proper position. The anesthetic which has been found the most valuable in my experience in these cases has been preliminary medication of morphine sulphate gr. 1/4, atropine gr. 1/150, forty minutes before the time set for operation. In nervous patients two drams of paraldehyde and two drams of potassium bromide are administered in four ounces of water per rectum on the evening preceding the morning of operation. The anesthesia itself is initiated by ether, drop method, with an open mask; as soon as the patient is under, warm ether-oxygen-vapor (Gwathmey apparatus) is substituted, using a nasal tube. The patient is placed in position for the operation before the anesthesia is begun.

*Position of the patient* (Figs. 1 and 2).—To render the parts to be subjected to operative attack *readily* accessible it is essential that the chest and shoulders of the patient be upon a higher plane than the abdomen. This is accomplished by elevating the upper portion of the patient from the shoulders to the level of the ensiform to a height of four to six inches. This may be accomplished by a special framework or by air cushions, or preferably by an elevator attachment on the table in conjunction with ordinary soft pillows. No complaint of backache has been made in patients so elevated.

*Incision.*—The ideal incision is one which will give adequate exposure of the parts involved to be operated and which will also afford opportunity for appendicectomy and for posterior gastroenterostomy should duodenal ulcer complicate the gall-bladder lesion. Such an incision begins midway between the ensiform and the tip of the ninth rib just below the

rib border. It parallels the border of the ribs until the region of the tip of the ninth rib is reached and then curves directly downward over the outer third of the rectus muscle. This skin incision is carried down to the fascia of the external oblique, which is incised in the same direction; the incision is then deepened through the rectus muscle, the epigastric part of the incision being carried half way across the fibers of the rectus and then splitting the muscle in an upward direction. The internal oblique aponeurosis, transversalis muscle and peritoneum are incised in the same direction for the full extent of the incision, care being taken in extending this incison downward through these structures to avoid injury to the tenth intercostal nerve. This nerve is easily raised from its bed and retracted out of the

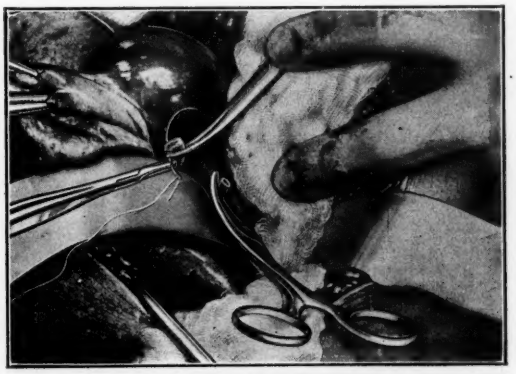

Fig. 7. Securing the cystic artery.

Fig. 8. Probing the common duct.

way. By retracting the lower part of this incision downward the appendix can usually be readily removed.

*Preliminary exploration of the peritoneal cavity.*—A general manual and, as far as practical, visual survey of the peritoneal contents is practiced and extraneous lesions and anomalies noted. The appendix is removed. All the above is omitted in cases in which infection is present and one proceeds directly to the

*Intraperitoneal isolation of the field of operation.*—Proper preparation of the patient, proper anesthesia and proper position renders the intraperitoneal isolation of the field of operation simple. Slight manipulation causes the lower edge of the liver and the gall-bladder to protrude into the wound (Fig. 3). The outer upper portion of the incision (the rib border over the liver) is retracted (Fig. 4). A gauze pad protects the outer lip of the incision. The upper part of the inner lip of the wound is retracted. Here also the wound is protected by a flat gauze pad. This retraction allows the stomach to bulge forward. Retraction at this point should not be forcible or difficulty may be experienced in controlling the stomach. Forcible retraction, if needed at all, is practiced on the rib border.

A pad is introduced to hold back the stomach (Fig. 4).

A pad is introduced to hold back the colon (Fig. 4).

If adhesions to the colon are present these are sectioned between clamps and ligated before introducing the colon pad.

The next step has to do with the gall-bladder itself. The contents are evacuated by a large aspirating needle and a vacuum apparatus (Fig. 4) and then grasped by clamps (the variety of clamp depending on the friability of the gall-bladder wall). If the gall-bladder is neither tense nor friable it is first grasped by clamps, drawn partially up and then evacuated. In either event the surrounding parts are protected by possible contamination by a yard square of loose moist gauze.

On withdrawing the suction needle the opening caused by its entrance is sealed by a forceps appropriate to the tissues to be grasped.

Further traction is made on the gall-bladder (Fig. 5) to bring it well up into and in many instances outside the incision. The tension exerted must be in relation to the strength of the gall-bladder tissues. It is aided when these tissues are friable by gentle manipulation and by pushing back the surrounding parts by means of the gauze already introduced.

A flexible metal retractor properly molded to fit the individual case is introduced at the middle third of the inner wound lip to retract the duodenum (Fig. 5). The lower edge of the retractor must not press on the tissues. This retractor puts the ligamentum-hepatico-duodenale upon the stretch and in connection with the tension exerted on the gall-bladder serves to expose all the parts involved in

the operation except the cystic duct, which is overlain by the ampulla of the gall-bladder.

The lesser cavity of the peritoneum is protected by packing the foramen of Winslow with moist gauze (Fig. 5).

The ampulla of the gall-bladder is seized by right-angled forceps and drawn upward (Fig. 5), exposing the upper portion of the cystic duct, which is covered by peritoneum and fat thickened in proportion to the degree of inflammation present (Fig. 5). This also gives good exposure of the gland which lies to the liver side of the cystic duct and which *when enlarged is always a diagnostic sign of gall-bladder disease, whether the gall-bladder appears externally to be diseased or not.*

The cystic duct is isolated by carefully scratching through the fat and peritoneum surrounding it with a right-angled clamp. Care must be taken *not to go too low down* on the duct. The duct arises from the liver side of the gall-bladder, not from the ampulla. If this is not remembered the common duct may be injured. The cystic duct is isolated without taking with it the cystic artery; rarely this is impossible. Usually a dissection can be made.

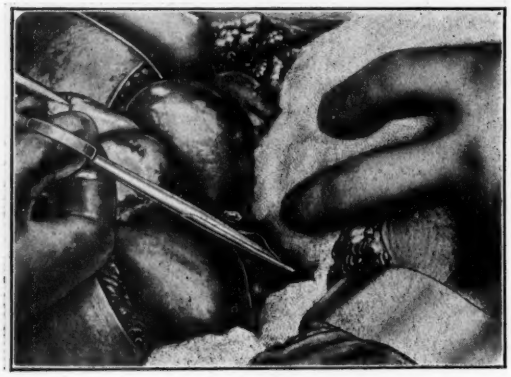

Fig. 9. Opening the common duct.

Fig. 10. Placing and securing T-tube in the common duct.

The right-angle clamp is used to make a little window (Fig. 5) to the liver side of the cystic duct and enough space is so created to grasp the duct below, *not* close to the common duct, by the same clamp (Fig. 6).

A second right-angled clamp now secures the duct sufficiently above the first to allow of section between the two (Fig. 6).

The cystic duct is sectioned between these clamps (Fig. 6). The right-angled clamp on the ampulla is removed, the one on the upper portion of the cystic duct making the traction necessary for exposure. Traction on the upper clamp with *slight* pressure downward with a stick sponge exposes the cystic artery which can at times be seen, but in any event can be secured by grasping the tissues forming the liver bed of the gall-bladder with a right-angled clamp at a *right angle* to the liver opposite the *upper* portion of the ampulla (Fig. 7). To grasp the artery in any other direction is dangerous, as the right hepatic duct, if anomalous, or even the right hepatic artery, may easily be injured. The tissues which contain the cystic artery must not be grasped at a lower but at a higher level than the point at which the cystic duct was sectioned and never in a direction toward the hepatic duct, but away from it.

These tissues are cut to the gall-bladder side of the clamp and the cystic duct end of the gall-bladder turned upward and the upper clamp on the cystic duct placed in the hands of the assistant who already has charge of the gall-bladder fundus and the retraction of the outer edge of the incision (Fig. 7). The gall-bladder is not removed until later. It serves a very useful purpose as a retractor in exposing the parts.

The cystic artery is ligated by needle-ligature (Fig. 7). The clamp is removed from the cystic duct and the size of the duct noted. *If* normal, and to be normal it must be very small indeed, and if there are no glands along the common duct and nothing to be felt or *seen* abnormal I am content to pass a very fine probe (Fig. 8) (and only a *very* fine probe will pass the *normal* duct) through it and the common duct into the duodenum. To pass into the common duct the probe must be bent as illustrated. If the duct is widened it should be split down to the common duct and the common duct also split (Fig. 9) sufficiently to allow of the passage of an appropriate-sized probe and sufficient visual exploration of the duct to insure its patency and freedom from stone or other obstruction.

To return to the normal cystic duct. The duct stump is seized in a forceps and a ligature applied

at a little distance from the common duct, not sufficiently close to give rise to subsequent stricture of the common duct at that point. The distal portion is excised and the cut end crushed with forceps to destroy the lining.

A widened duct requires different treatment. The common duct having been incised and cleared of stones, the stump of the cystic duct is excised to within one-quarter of an inch of the common duct. A rubber T-tube of appropriate size is introduced into the common duct for temporary drainage (8 to 10 days) and the incision in the common duct closed by a few interrupted sutures up to the point where the T-tube emerges (Fig. 10). These sutures should not pierce the lumen of the duct.

If during the operation on the deeper parts acci-

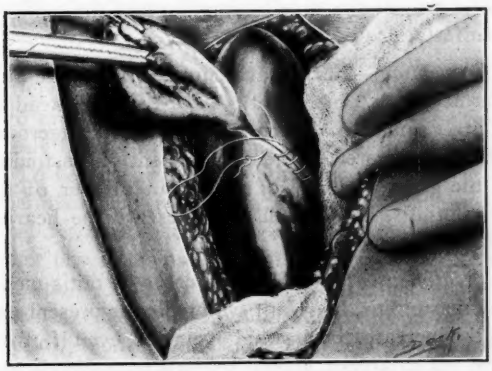

Fig. 11. Suturing over the raw surface of the liver.

dental injury to the hepatic artery or an anomalous bloodvessel occurs (anomalies of the blood supply of the liver are fairly common) the ligamentum hepatico-duodenale can be gently grasped by a gastroenterostomy clamp and the entire blood supply of the parts be thus immediately brought under control. Careful bloodless dissection can then be made, the extent of the injury noted and proper repair made.

The deeper work on the common duct being completed, the covering of the raw surface in the liver, the gall-bladder bed, *pari passu* with the further removal of the gall-bladder is proceeded with (Fig. 11). If the gall-bladder is carefully removed, in many cases surprisingly little raw surface is left. Usually the peritoneal attachments of the gall-bladder to the liver can be readily approximated. If it becomes necessary to pierce the liver substance care should be taken that softened catgut of a size which will fill the needle puncture be used and also a round needle. The suture is continuous and applied with only sufficient tension to control bleeding.

Finally a split tube-drain is led to the foramen of Winslow (a second one to the anterior surface of the ligamentum hepatico-duodenale if the common duct has been drained), the gauze and laparotomy pads are removed, the position of the patient leveled to reduce tension in suturing the wound, and the wound closed in layers.

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## LABYRINTHITIS AS A COMPLICATION OF MASTOIDITIS.*

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Labyrinthitis can develop and exist independently of mastoiditis; also mastoiditis without an apparent involvement of the labyrinth. In fact labyrinthitis is not a very frequent complication of acute mastoiditis, but more often of the chronic type where it makes the problem of mastoditis a much more serious one. Fortunately, in the great majority of the acute mastoid cases the infection has passed right on from the post-nasal space *via* the Eustachian tube, to the middle ear, to the antrum of the mastoid and to the mastoid cells, without apparently touching the labyrinth, which is particularly apt to be the case when there is no prolonged midde ear tension.

The more cases of otitis media that are relieved by an early paracentisis the less mastoiditis we see. This holds good also, but still more so, with respect to labyrinthitis. In the course of a mastoiditis we never know from the very beginning to the last day, or even after apparent complete recovery, that a labyrinthitis may not develop at any time. It therefore behooves us to be continuously on guard against this complication.

Labyrinthitis in connection with mastoiditis presents several points of special interest and great importance: In the first place as a labyrinthitis in any of the various forms or degrees. Second, on account of the possibility of infecting the contents of the cranial cavity by way of the avenues passing through the pyramid, for the endolymphatic space of the inner ear has a projection into the posterior fossa of the cranial cavity, called the ductus endolymphaticus, which forms a small pouch on the posterior aspect of the petrous portion, and any infection within this endolymphatic space can in this way easily be transmitted through this duct to the cerebellar fossa. There is another opening in the pyramid connecting the cranium with the inner ear,

* Read at the meeting of the Milwaukee Oto-Ophthalmic Club, March, 1917.

namely the internal meatus through which pass the acoustic and facial nerves with the concomitant bloodvessels and lymphatics, forming a possible channel for intra-cranial infection. The third interesting feature in regard to the labyrinth in mastoid disease is the function of the labyrinth, which function, or absence of such, greatly assists in the diagnosis and even the localization of intracranial complications. It is hardly necessary to discuss the question of etiology of labyrinthitis in the presence of mastoiditis beyond again emphasizing the fact that the chronic otitis media with the chronic mastoiditis, by means of their chronic and destructive tendency frequently produce an extension of this destruction into the labyrinth. But not always is the direct extension into the labyrinth the cause of labyrinthitis. There is such a thing as an infection through the blood- and the lymph-channels.

*Diagnosis.*—How do we know we are dealing with a labyrinthitis in addition to mastoiditis in a given case? Just as soon as there are dizziness or vertigo, nausea, disturbance of the equilibrium, otitic nystagmus, severe disturbances in, or absence of hearing—our suspicion must be at once aroused and a labyrinthitis or at least a labyrinth irritation must be suspected. It then remains for us to find out exactly what we are dealing with and to establish the particular kind of labyrinthine involvement and the degree of such. We have general rules that are of use in the diagnosis of these cases.

In the diagnosis of labyrinthitis it is of prime importance that we correctly interpret the symptoms presented by the patient and in addition employ the physiological tests of the labyrinth. Among the symptoms we find dizziness, vertigo, nausea, spontaneous otitic nystagmus and defective hearing practically always present to a greater or lesser degree and this *degree* helps us in our diagnosis to some extent.

The condition of the hearing and the direction of the spontaneous nystagmus, or of the physiologically induced nystagmus, are our strongest aids in making a differential diagnosis.

The direction of the nystagmus is always toward the side of the strongest stimulation.

Vestibular and cochlear tests must both be made in every case. We put the following rules for differential diagnosis:

1. With hearing fair and nystagmus to the diseased side we diagnose a labyrinth irritation or circumscribed or serous labyrinthitis. Serous labyrinthitis has one distinguishing point, namely the patient is deaf to the speaking voice but not to the tuning fork.

2. With the hearing *gone* and nystagmus to the *well* side we pronounce the condition one of purulent labyrinthitis. Some severe forms of serous labyrinthitis will also manifest these symptoms.

3. With the hearing gone and spontaneous nystagmus to the *diseased* side we suspect an intracranial complication, particularly so if the nystagmus has an increasing tendency and the Weber test points to the healthy side.

Of course these are not iron-bound rules and we must expect to meet with exceptions.

I have touched only upon the salient points, leaving out of consideration such important diagnostic aids as the *fistula* symptom and the pointing manifestations of Barañy.

*Prevention.*—Early paracentesis and gentle suction at the external meatus of the ear (instead of Politzer inflation, which is extremely dangerous) will not only prevent the development of mastoiditis in the great majority of cases, but oftener of the labyrinthitis, and it will also preserve the hearing power.

*Treatment.*—If in the acute cases of otitis media and mastoiditis, labyrinth symptoms are present and on the increase, the mastoid operation, even if otherwise not so urgent, should be done immediately and the wound left in condition for a secondary operation in case this operation does not relieve the labyrinth symptoms.

The treatment of labyrinthitis of any kind in the presence of mastoiditis is the treatment for mastoiditis, namely, mastoid operation, as carefully and quickly performed and with as little traumatism as possible—plus such measures as absolute rest in bed, sedatives, etc., watching for changes in the symptoms. If after twenty-four hours the symptoms become more manifest instead of subsiding, and the physiological reaction of the labyrinth becomes extinct, a secondary operation after the method of Neumann, which destroys and drains the labyrinth, must be considered. It is imperative to expose the dura of the posterior fossa in this operation, always carefully guarding the facial nerve against injury or exposure.

In closing I would warn against a too sanguine prognosis with regard to the hearing in mastoid operations, because a labyrinthitis as a possible complication will often entail permanent deafness in the operated ear; while as a rule we expect good hearing following the simple mastoid operation.

# PRACTICAL LOCAL ANESTHESIA.*

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The title, "Practical Local Anesthesia," gives me excuse not to consider spinal anesthesia, paravertebral, and sacral blocking, all of which are practical in some hands, although for the average operator I do not consider them always so.

*Infiltration anesthesia* is the production of freedom from painful manipulation by saturating with the solution the tissues in the region to be operated upon; that is anesthetizing terminal nerve filaments.

*Conduction anesthesia* means the interruption of sensation by injecting the nerve that supplies the area to be operated, by putting the solution into the nerve substance, its sheath, or immediately surrounding it.

These two forms of injection anesthesia are quite different theoretically, but practically are similar and are both used in my work, in which, however, I rely most on infiltration.

To be successful the infiltration of tissue in the operative field requires a technic with many distinct features, but I have demonstrated to myself, other physicians and my patients that it is practical and only demands certain information, qualifications and close attention to all details to be satisfactorily done. This form of anesthesia eliminates the slight but certain risk of mortality that a general narcosis carries.

Farr, of Minneapolis, combines local anesthesia and narcotization with morphine and scopolamin, a "twilight sleep" affair that may be more desirable in some instances than either an inhalation anesthesia or plain local anesthesia.

Even though nitrous oxid-and-oxygen has gone far towards eliminating the horror of being put to sleep, most people regard any general or inhalation anesthesia with a degree of dread, therefore there is a ready field for painless surgery by the injection of solutions.

Not every patient is able to stand work under this method, nor does it mean hypnotism as some would have you think. A great many individuals have as much fear of knowing the surgery is being done as of being unconscious from an inhalation anesthesia. Many require the repeated assurance that the procedure will be painless, together with such drugs as morphine and scopolamin to take the "hypertension off the apprehension." In fact, I always give morphine 1/6 to 1/4 gr. and scopolamin 1/150 to 1/200 gr. one hour before starting to operate.

* Read before the San Diego County Medical Society, April 9, 1917.

Another essential for surgery under local anesthesia is a definite knowledge of the regional anatomy and nerve supply and a knowledge of which structures require better infiltration. The skin needs much care, the subcuticular fat little, muscle a medium amount. This knowledge is hardly less important than gentleness and regard for the tissues.

The surgeon usually should be seated, perfectly at ease, and possessing the complete confidence of the patient both preceding and during the operation. Do not fail to tell the patient when you are going to stick him with the first needle, as this keeps his confidence and makes for a satisfactory mental attitude. As small a thing as this at the beginning may mean success or complete failure in carrying out a satisfactory procedure.

The manner of injecting the solution is important; keep the piston moving and make the solution slowly precede the needle point.

The patient must be made perfectly comfortable on the table, as it is most essential that he is not restless.

A fact to be well borne in mind is that the effect of the solution is not immediate and a little time and firm gentle pressure over the area are necessary before the tissues are insensible to pain. Anesthesia lasts from one to four hours, depending on location and method.

If syringes and needles are not the proper size and length, good results will not be secured. Also sharp cutting instruments are absolutely necessary. If tension or pressure is made in the use of improper instruments, pain is produced. However, I must state that tension and pressure are most difficult to overcome in local anesthesia work and they must be carefully avoided.

Novocaine, which is easily sterilized, is the ideal, effectual non-toxic drug used in practically all this work. Other drugs have been combined with it but are not necessary and had best be omitted. I use a solution of one-half per cent. novocaine and add eight minims of a fresh 1 to 1000 solution of adrenalin to the ounce at the time of use. The tablets of novocaine are satisfactory. The strength of both novocaine and adrenalin, especially the latter, is varied according to indications.

One finds few idiosyncrasies to novocaine and some use as much as 1 gm. (15 gr.) with no untoward results, though I rarely use more than 5 gr. in any major operation. There appears to result no inhibition of healing nor, apparently, does it make the area more susceptible to infection.

There are certain conditions when quinine and urea are satisfactory and more desirable than novo-

caine and its effects last longer, usually from 24 to 72 hours.

The field can be, and is, rendered nearly bloodless by the use of adrenalin, which also prolongs the anesthesia effect of the novocaine. Any vessel seen in the wound should be given an extra amount of the solution in its region before being clamped, as it carries a nerve that is always sensitive.

At the present time dentists, eye, ear, nose and throat specialists are doing their work painlessly with local anesthesia and so I maintain that most surgery can likewise be done.

Such conditions as inguinal hernia can be operated upon painlessly and without shock. Moreover, in dealing with the sac the patient at the request of the operator can fill the sac, which is sometimes of value.

Strangulated hernia in the aged demands local anesthesia, as all the time necessary can be spent testing the vitality of the gut, with no bad effects, whereas under general narcosis the saving of time is a great item in the welfare of the patient.

In practically all of my hernia work I have used local anesthesia to the entire satisfaction of myself and patients.

I have also had most satisfactory results in hemorrhoid work. Proper infiltration enables one to thoroughly dilate the sphincter with freedom from actual pain and the removal of the tumors is easily made painless.

In bad risks with the aged I have opened the abdomen under local anesthesia and where it did not seem satisfactory to complete the work in this way I have used a very small amount of ether, much less being required than under ordinary circumstances. This occurred in two cases quite recently in elderly women with ruptured appendices, where I expected only to drain, but upon opening the abdomen it seemed best to perform appendicectomy with drainage. With slight inhalation anesthesia while dealing with the inflamed appendix only, not enough to produce nausea and vomiting, both made remarkably rapid recoveries. Considering their age and poor physical condition, the bad effects of a longer general anesthesia and the usual vomiting, such an outcome might not have been the case.

I am becoming convinced that more abdominal surgery should be done as follows: First, give enough morphine and scopolamine to benumb psychically; second, inject the abdominal wall with novocaine to benumb physically; then if unable to complete the intra-abdominal work without pain, we have an ideal condition for the use of a small amount of nitrous oxid and oxygen, discontinuing it as soon as this part of the operation is finished, and completing the work under the nerve blocking. Many intra-abdominal conditions can be dealt with without pain. Thus, the gall-bladder, appendix and fundus uteri are insensible to cutting and pricking; but tension on the mesentery or its attachments is the part that causes pain, and by injecting mesentery, etc., these tissues may be painlessly dealt with.

I have found that local anesthesia can be used effectively in vaginal plastic operations also, except in perineorrhaphy, and then there is tension and pain only when the levator ani is pulled together, which could be overcome by sacral blocking, a procedure I do not think necessary, as the patients stand it with only slight complaint.

I have not had an opportunity to use local anesthesia in a Cesarean section as yet, but am anxious to do so, with all confidence of being successful if the patient is a good subject. Clarence Webster and others are performing a number in this way, entirely satisfactory to the mother's sense of pain endurance.

In summarizing, I would like to say that practical local anesthesia is adaptable to most surgery, but lends itself best to certain operations and certain individuals, and it should be used with these points well considered. Psychology is desirable and if you can hypnotize it is all right but not essential.

Proper instruments, perfect knowledge of anatomy, a preliminary hypnotic, gentleness, confidence in oneself, securing and retaining the confidence of the patient are all essential.

I would emphasize that the temperament and personality of the surgeon are of greater worth in surgery with local, than with a general anesthetic.

## URINARY TUBERCULOSIS.

The finding of tubercle bacilli, accompanied by blood and pus cells, is the only absolute and unequivocal sign of tuberculosis of the kidney. The appearance of tubercle bacilli in the urine does not by any means necessarily indicate urinary tuberculosis. Orth has demonstrated that tubercle bacilli can pass through the healthy mucous membrane from the blood without causing any local lesion. Tubercle bacilli are frequently found in the urine of tuberculous patients whose urinary tract is innocent of any pathological lesion. The urine should be drawn off from each ureter under proper aseptic precautions, and examined first for tubercle bacilli, pus and blood, and secondly for the functional value of each kidney and for secondary nephritis. There should be no hesitancy in accepting this risk, for it has been found by actual practice that the danger of infection is far less than the disaster to be encountered if this examination is not made.—OLIVER LYONS in *Colorado Medicine*.

# NITROUS OXID-OXYGEN ANESTHESIA IN GENERAL SURGERY.

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The literature relating to nitrous oxid-oxygen anesthesia for the performance of minor surgical, dental and obstetrical procedures has become quite voluminous during the last few years; but there is a strange paucity of important contributions concerning this method of inducing anesthesia for major operations. However, it is well known that many surgeons now insist upon nitrous oxid-oxygen being used in their general surgical work.

The belief formerly prevailing that nitrous oxid could be safely employed only for minor surgical procedures requiring short administrations has been shown distinctly fallacious; certainly an anesthetic that may be continuously administered for four hours without producing injurious immediate or remote after-effects must be regarded as the safest known agent for that purpose. Such a statement could not be applied to any other agent for the induction of general anesthesia. And based upon my experience I have no hesitation in asserting that there are few contraindications to the employment of nitrous oxid-oxygen in general surgery; regardless of the length of its administration, the previous mental and physical status of the patient is restored within a few minutes after the gas is withdrawn. Furthermore, when administered by an expert nitrous oxid-oxygen has practically no limitations as a general anesthetic.

"The testimony of surgeons who have accustomed themselves to operate with nitrous oxid-oxygen—that their technique is rendered more accurate, that the patient's condition as regards immediate and end-results is immeasurably better, and that the margin of safety is so much wider as to permit of operative intervention in many cases formerly considered impossible risks—would indicate that nitrous oxid-oxygen will eventually supersede to a large extent the older anesthetics." (Miller.)

The advantage claimed by Miller for nitrous oxid-oxygen anesthesia consists in freedom from after-effects. Recovery is immediate; there is no irritation of the kidneys or the respiratory system; no fatty degeneration of organs; changes in the blood are transient. The resistance of the patient is not lowered; if infection be present his power is not wasted in fighting the after-effects of the anesthetic, but is ready to combat the poison; in fact, soon after the inhaler has been removed from the patient's face all effects of the anesthetic are dissipated.

Casto found there was a tendency for the blood pressure to rise, but only when cyanosis appeared; hemoglobin was reduced, the blood index returning to normal after gas had been discontinued for twenty or thirty minutes. The coagulation time of the blood was decreased on the average more than one minute, returning to normal about twenty minutes after discontinuance of the gas. "A surgical clinic which does not employ gas anesthesia, from the standpoint of anesthetics, is a poorly conducted clinic." (Bevan.)

Twenty-one deaths under nitrous oxid-oxygen anesthesia have been recorded in the literature, eleven of which were reported as attributable to the anesthetic. Teter (1915) collected 938,924 cases of nitrous oxid, 32,172 of nitrous oxid and air, and 190,724 of nitrous oxid-oxygen anesthesia (total of 1,161,820) with two deaths. Statistics compiled by Andrews nearly fifty years ago covering over 200,000 cases showed the mortality of anesthetics then used as follows: chloroform one death in 2,723; sulphuric ether one in 23,204; mixed chloroform and ether one in about 7,000; nitrous oxid no deaths in 75,000 cases. Davis says it has for some time been his custom to give nitrous oxid-oxygen for very serious cases where it was thought the anesthetic of extreme danger. "We have not had a death which could in any way be attributed to its use, and we all believe that it has been the means of saving many lives." (Davis.) The author further adds that nitrous oxid and oxygen, combined in the proper proportions and skillfully administered in suitable cases, is undoubtedly the most desirable and safest of general anesthetics, in which opinion I fully concur after a rather extensive experience with the various methods of inducing surgical anesthesia.

The technique of gas administration is now so well understood that further comment seems unnecessary. It should be given only by those familiar with the possible dangers incident to inexpert administration, remembering that technical error may at any time be responsible for the sacrifice of a human life. It is of the utmost importance to guard against cyanosis and respiratory difficulty by careful regulation of the admixture of gas and oxygen, especially during prolonged administration.

I agree with Miller that gas-oxygen is contraindicated in children under five years, because of the small size of the respiratory passages and the increased liability to asphyxial symptoms; for the same reason it should not be employed in enlarged tonsils, cellulitis, tumors of the neck or other respiratory obstruction. It is contraindicated in serious cardiac lesions with broken compensation, aneurism, emphysema, and marked arteriosclerosis.

Some of the contraindications mentioned by Sajous (1915) are abstracted merely to suggest that they do not appear to be well founded: Circulatory abnormalities constitute the most frequent contraindications to nitrous oxid; it should be avoided in well-marked atheroma—especially if high blood pressure coexists—and in cardiac dilatation, with or without valvular lesion. Mitral stenosis, aortic regurgitation, and "beer heart"* are generally held to contraindicate nitrous oxid, also the combination of high blood pressure with a weak cardiac first sound.

Buxton regards the anemic individual; the overgrown boy; the nervous, sensitive child subject to fainting; the child with congenital cyanosis, and the person with hypertrophied heart; as among the most dangerous types of individuals for nitrous oxid because of their liability to syncope and asphyxia. He admits, however, that if care be exercised to obviate struggling and undue exclusion of air or oxygen, no absolute contraindication to gas anesthesia is presented in even such cases.

Marked respiratory embarrassment, especially if due to swelling which will be made worse through venous congestion, contraindicates nitrous oxid anesthesia; but if dyspnea be of minor extent—as is frequently noted in patients with tonsillar swellings, Ludwig's angina, glandular and other enlargements exerting pressure on the respiratory channels, enlarged thymus, large adenoids, intra-abdominal effusions or neoplasms pressing on the diaphragm and heart, obesity, pleural adhesions, and general affections causing dyspnea—nitrous oxid may be used provided care is taken to avoid asphyxia during the anesthesia.

In the aged intolerance of asphyxia and circulatory stress is likewise a feature to be remembered, especially if chronic bronchitis is present; nitrous oxid, however, is not contraindicated by old age *per se*. (Sajous.)

It is suggested by Miller that in unskilled hands, as a routine anesthetic, nitrous oxid-oxygen is undoubtedly more dangerous than ether. In the hands of the expert, also, the routine use of nitrous oxid-oxygen is attended by greater immediate danger than accompanies expert etherization. In selected cases the expert can save many lives which would be forfeited under ether or chloroform anesthesia by the use of nitrous oxid-oxygen.

I agree perfectly with Botsford that insufficient muscular relaxation is not only the chief objection made by the surgeon, but also the main difficulty encountered by the anesthetizer in administering nitrous oxid and oxygen. It is always possible, however, to control or modify muscular tension by the addition of ether, and with proper co-operation on part of surgeon and assistants the amount may be so small as to produce no systemic effect, and the patient awakens at completion of the operation to full consciousness as though no ether had been used.

Contrary to the opinions of other authors nitrous oxid is believed to be especially desirable as an anesthetic in patients with anemia and acute infections; and in those with impaired kidneys and respiratory affections it should always be employed in preference to ether or chloroform. In all patients who are considered serious surgical risks, such as those with general peritonitis, in the presence of shock from any cause, for amputations, Caesarian operations, etc., it is the anesthetic of choice.

Preliminary to the administration of nitrous oxid-oxygen anesthesia in general surgery it has been my custom to give the patient one hypodermic of atropine sulphate gr. 1/200 to gr. 1/150; and where there is no contraindication I include morphine gr. 1/8 to gr. 1/4. These drugs have been found advantageous in that after their administration greater relaxation of the patient may be secured during the nitrous oxid-oxygen anesthesia.

In this connection it seems pertinent to remark that during the last few years there have been devised and described nearly thirty types or modifications of apparatus for the administration of nitrous oxid-oxygen anesthesia. Personally I have used eight different kinds in private and hospital practice. For the induction of surgical anesthesia I now prefer the so-called "safety" apparatus manufactured in Chicago, Ill., for which the following are some of the advantages claimed:

(1) The instrument is simple in construction and easy of manipulation.

(2) A sight-feed arrangement enables the anesthetizer to ascertain at any time whether the patient is receiving the proper admixture of gas and oxygen.

(3) The gases are intermixed in the "mixing chamber" of the instrument and not in the administration bag.

(4) The proper ratio of gas and oxygen may be maintained with the minimum amount of mechanical adjustment.

(5) The gases are mixed, "warmed, washed and moistened" before reaching the respiratory organs of the patient.

(6) The administration bag is so constructed as to permit of direct rebreathing whenever this is desired.

* Just what is meant by "beer-heart" does not appear to have been satisfactorily explained by Sajous or other authors who have copied from his writings. I confess utter ignorance upon the subject.—E. L. H.

(7) The mask includes a cylinder for ether administration provided this becomes necessary or advisable.

(8) The mask is so arranged that no adjustment is necessary, and either the nose or full-face mask may be used.

(9) The apparatus is light, readily portable, and insures "simplicity, efficiency, safety, economy, and accuracy."

For the induction of surgical anesthesia with nitrous oxid-oxygen I am now using this so-called "safety" appliance almost exclusively, and have found it entirely satisfactory. The sight-feed arrangement is considered one of the greatest improvements.

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## RADICAL OPERATION FOR UMBILICAL HERNIA, COMPLICATED BY EXCESSIVE ABDOMINAL FAT. A CASE REPORT.*

Report of Case, and Presentation of Specimen.

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Obesity and repeated pregnancies are the most common factors in the development of the umbilical hernias of adults; hence statistics show that the majority of cases occur in women. Piersol[1] states that nearly 75 per cent. are in women. The umbilical ring is so constructed that its weakest segment is the upper half of its circumference; at this portion, as a rule, one finds signs of protrusion and relaxation of the ring, the latter yielding more and more as the omentum, omental fat and, often the colon, forced on by the increased intra-abdominal pressure, are pushed forward towards the exterior; often the linea alba is involved to such an extent that a sort of ventral hernia is developed ultimately. Numerous diverticula or sacculations form, the growth of omental fat soon making the contents of the hernia irreducible, intestinal obstruction and incarceration often supervening. The peritoneum becomes extremely thin; the increase in the size of the tumor is frequently observed to take place *pari passu* with the development of the obesity.

The treatment is prophylactic, palliative, or radically surgical. The mortality following operation is still relatively high.

Mrs. ———, a German housewife of thirty, married nine years, was never pregnant, but always regular in her menstrual periods. Her family history is negative; her parents are living and in good health; her father is of medium height and weight, her mother less than five feet in height and below the average in weight. She has three brothers all of whom are of medium height and weight.

Her health has always been good except for the discomfort of her *excessive weight*, which was considerably over *300 pounds!* The pain and distress occasioned by the disturbances occurring at various intervals on account of pressure and obstruction in the portion of the intestines contained within the umbilical hernial sac were at times very severe.

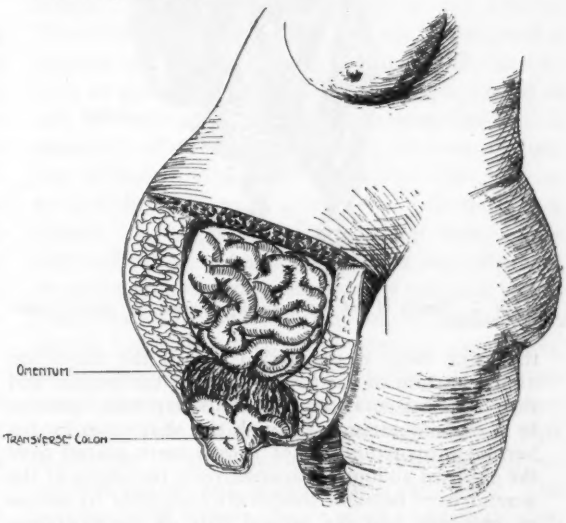


Fig. 1. Schematic. Observe the coil of transverse colon with the hernial sac.

At about her twelfth year, she began to increase in weight rapidly following a violent fall down a flight of stairs, which rendered her unconscious for several days; and about ten years ago she discovered a protrusion at the umbilicus which rapidly increased in size, the abdomen at the same time becoming thicker, heavier, and more pendulous. Just prior to operation on April 7, 1916, the hernial ring measured fifteen cm. in one diameter and twelve cm. in the other; the abdomen measured a fraction over 167 cm. in circumference; her height was five feet and four inches, and the pendulous abdominal wall, the patient standing, reached over the pubes more than *half* way to her knees. The hernia protruded markedly and it was not difficult to determine by palpation and percussion that in addition to omentum, a considerable amount of intestine contributed to the elements of the sac contents.

The operation was performed under ether. The skin was prepared with iodin. An area including

* Presented before the Jackson Co. (Mo.) Medical Society, April 11, 1916.

all of the protruding hernia having been outlined, an incision in the form of an ellipse was made measuring 107 cm. in length and 30 cm. in width. Very *rapid* dissection of the wall of fat was carried out, beginning with the left corner, attending carefully to hemostasis, and proceeding toward the region of the hernia; at the umbilicus the layer of fat suddenly disappeared, owing to the protrusion of the thin peritoneal sac toward the surface, *i. e.*, just beneath the skin. Stopping the dissection here

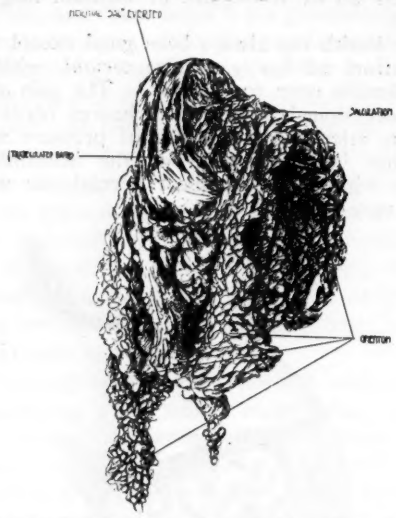

Fig. 2. Sketch of flat flap excised. Incision 107 cm in length. (42 inches.)

the same steps were carried out in the dissection of the portion of fat to the right of the hernia, and then with scissors, the enormous flap was removed by a circular incision through the skin covering the hernial protrustion. Hot towels were placed over the exposed abdominal aponeuroses, the edges of the wound were brought temporarily together by means of tenacula, and the second half of the operative

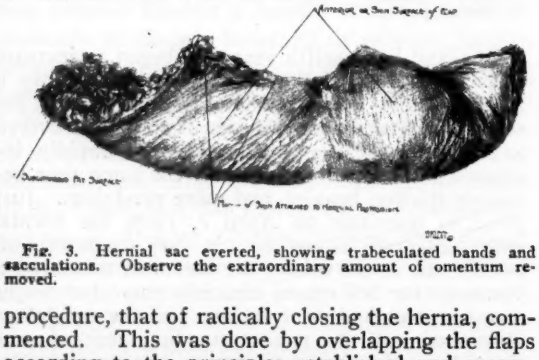

Fig. 3. Hernial sac everted, showing trabeculated bands and sacculations. Observe the extraordinary amount of omentum removed.

procedure, that of radically closing the hernia, commenced. This was done by overlapping the flaps according to the principles established and recommended by C. H. Mayo[2] for the closure of ventral and umbilical hernias, with the difference that silk was used here for the mattress sutures. The hernial sac was large and sacculated, contained the entire omentum and the greater portion of the transverse colon. The flap of belly-wall fat removed, together with the hernial contents, weighed forty pounds. The gap was closed with several silver wire retaining sutures, between which were inserted "interrupted continuous" sutures of catgut, and an 8-inch gutta percha drain was placed at each end of the long incision.

The post-operative course was remarkable for the absence of shock; healing occurred by first intention, and twelve days after operation, there was entire absence of signs of infection, though the condition of the skin along the lower portion of the abdomen, *i. e.*, over the pubic region, had invited contamination. Twelve months following the operation the patient was in perfect health, neither the hernia nor the adiposity showing any tendency whatever to recur.

The case is of unusual interest though a number of similar ones have been reported, the most conspicuous among the latter being one described by Cullen[3], of Baltimore. Howard A. Kelly is credited with being the first to recommend this procedure (lipectomy) for the cure of such an unhappy combination of physical defect and deformity as the one described above.

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## MEDICO-MILITARY EXPERIENCES.

### SIDE-LIGHTS ON THE DAILY WORK OF AN AMERICAN MEDICAL RESERVE CORPS OFFICER ABROAD.

[In the September issue we publish the first letter from First Lieut. Arthur E. Guedel, M. R. C., relating his impressions of two months of active army duty in this country. Following is his second letter descriptive of his trip abroad. It is not only interesting but very reassuring.—Ed.]

Editor American Journal of Surgery:

"Uncle Sam's personally conducted tour" is well named. I cannot imagine easier or more interesting ocean travel than ours was to Europe. Free from all responsibility, free from all care save perhaps one, with ever intermingling senses of anticipation and realization of interesting incidents, ours was a happy party.

There were fifty of us unattached medical officers on a transatlantic liner, together with two regiments of engineers, making about three thousand passengers all told. Yes, we were crowded, but not so much so as the foregoing statement would indicate, and the general spirit of good fellowship which prevailed more than compensated for what, in civil life, might have been considered too many people in too small a space. All officers had first class staterooms. The troops were carried below deck in specially constructed and well-ventilated quarters. However, the weather was so delightful that everybody spent most of his time by day on deck.

There was always something doing to render the voyage free from monotony and the fourteen days on the ocean passed quickly by. Those regiments of engineers comprised an exceptionally fine lot of men and many of them were, of course, good athletes. Boxing was staged daily and there was ample material to furnish an entire new card each day, which was done except when there was a call for the return of some unusually clever man. These men were not of the rough-neck slugging variety. On the contrary, there were many college athletes and some professional wielders of the mattress mitt and the average quality of these bouts was higher than that of the usual boxing show back home. Certainly the sporting spirit was better.

Band concerts formed another daily feature, usually in the middle of the afternoon.

Each day the troops were put through regular drills, working on the promenade deck in squads of about two hundred. Their work began very early in the morning, as each officer whose stateroom opened on the promenade deck can testify. That early morning snooze was for the first few mornings entirely disrupted by loud commands and the louder clatter of arms. However, nobody considered this an inconvenience for by the time the novelty and interest in these movements had worn off we had become accustomed to the noise and continued our morning nap.

Officers and men had separate lounging rooms most comfortably furnished and with well-equipped libraries. The pianos were going strong most of the time. There were a number of good musicians on board and bashfulness was a thing not present. Everybody who could play did so and the repertoire covered everything from the classics down to "The Old Gray Mare and the Whiffle Tree." Each evening would see these rooms filled and the songs were typical of good fellows together. Sometimes everybody sang and then it was fortunate that the two rooms were well separated. However, as a rule the floor was given over to those who *could* sing and the rest of us sat back and enjoyed it. There were a couple of excellent quartettes among the men of the regiments and these were much in demand. They could sing indeed. I remember that one of them sang "Asleep in the Deep" most beautifully, but for some reason or other this particular song failed to make a hit.

I spoke above of our freedom from all care save perhaps one, and that one was the so-called submarine danger. Danger? Well, perhaps it was, but so far as our lives were concerned it seemed at most a small one. At any rate with most of those on board this was more a subject for good jokes than it was a care, and the jokers would get busy whenever a manifestly timid passenger put in his appearance. Many stories were told of submarine atrocities and these stories were of such a character as to make the tales of Baron Munchausen monuments of fact by comparison. At first the apparent discomfiture of the timid man upon hearing these stories was funny. This might seem uncharitable and but poor sport. As a matter of fact those tales did more toward quieting his fears ultimately than anything else could have done, for usually the competition among our "historians" soon brought out stories that even the most gullible must reject. Then the pendulum would swing to the other extreme and the timid one, not knowing what to believe, believed nothing.

The real danger was small, for we were well protected. There were several ships in our convoy. There was no doubt that in case we had stopped a torpedo we should have been taken off immediately or picked up in a very short time if forced to take to the water. But any one who has seen a squadron of destroyers at work at once realizes how difficult it is for the submarine—"tin fish" as we call them—to work when these little devils are around. It was magnificent to watch them. Bobbing and rolling around, one moment here, the next there; sometimes sliding along lazily with our bigger and slower ships and then skipping off suddenly at almost incredible speed on a scouting expedition, they seemed to be everywhere at once. The cognomen "mosquito fleet" truly applies to their appearance, but their activity impressed us more like that of hornets. The submarines have learned from experience not to mix things with a destroyer. The German sailor likes to live as much as anybody else.

I am sure that the fear of the submarine by those back home is unnecessarily magnified. For example, we were much more anxious on our first few days out of America when there was no danger of attack than toward the end of the journey when we were in the "danger zone." This was not due to the fact that constant association with any danger lends immunity to fear of it. It was due rather to our acquired knowledge of the efficient protection provided for us, a knowledge gained first-hand of the true state of affairs. The only fear that the ships' officers had regarding loss of life in case of attack was that of panic among the passengers. They stated that during the past year nearly all deaths in submarine attacks on passenger ships were due to panic.

To guard against such panic we were all put through lifeboat drills repeatedly. These drills were conducted at any time during the day and once at night. Each man had assigned to him a definite position at the lifeboats or rafts and at the warning

bugle call would proceed at once to his position and stand at attention. Each boat squad was well commanded and the discipline here was very rigid. With the first few drills there was some confusion, but later it was remarkable to see every man in position and ready to "abandon ship" within three or four minutes after the warning call, and not a word or a command spoken.

When I state that fear of the submarine by the ships' officers was negligible I do not mean that they were careless to it. It was their care and the fact that they compelled every precaution to be observed together with their never-relenting watch that reduced our concern to almost nothing. We were compelled to wear our life-belts constantly during the last four days of the voyage. We walked in them, rested in them, even ate our meals in them and at night slept with them under our pillows. Each man on board was instructed personally as to the use of the life-belts and each belt was inspected daily by the commanders of the boat squads to see that they were in perfect shape. At first the life-belt regulations caused us considerable annoyance, but we soon were used to them. We tried for a while to give the belts a suitable appellation, but inasmuch as profanity is considered bad taste even in the Army, we gave up the idea.

Lights out or port holes closed was the order and one to be obeyed. Our ships were not the brilliantly-lighted ocean palaces of peace times. Far from it. Any spark of light on deck at night was sure to elicit an immediate yell from a ship's officer or the guard. No smoking on deck at night. Some idea of how dark it was on the outside of these ships is had from the statement that as a rule it was impossible for us to distinguish the outlines of the other ships in the convoy, even though they were but three or four hundred yards away. The guiding light carried by each ship was so shaded that it could be seen only from a short distance astern.

It is the fact that the submarine danger is treated as a great one which renders it small and it is the close observance of every precaution that is rendering the shipping of troops abroad a safe procedure. It is due to these careful tactics that the British have been able to carry some four hundred thousand Canadian troops across the Atlantic without the loss of a single man.

It might seem that this darkness and the other rigid regulations would render the trip unpleasant, but everybody entered into the game with such a jovial spirit that it was more interesting than the uneventful ocean voyage of peace times.

One of our favorite daily pastimes was searching the sea for periscopes. To the timid ones any floating débris, a barrel, the fin of a great fish, etc., would usually assume the appearance of a periscope and the call, as per instructions, from any of the passengers of "Starboard bow" or "Port bow" always brought a rush of glasses to bear upon the point indicated. Then the remark, which toward the end of the trip assumed a tone almost of disappointment, "It is a barrel" would usually break up the party for the time being.

The incidents of our departure from America and our arrival abroad will remain with us longest. I do not believe that the word artist lives who can adequately portray the thrill of our departure, and I shall certainly not attempt it.

It was in the early evening of one day that we started. What with the weighing of anchors, the raising of colors, stirring music from the regimental bands, and the continuous cheering of many thousands of soldiers as those great liners began to maneuver into their place in line, there was a thrill for every man, a thrill that, as stated by some, was almost worth a life's work. We understood then, most of us for the first time in our lives, what it is that makes the old campaigner go back to the Army in time of war. There was not a man among us at that moment who could express the vastness and depth of that thrill and who did not feel sorry for the fellow back home. Then as the fleet moved along out of the harbor a strange quiet prevailed, probably the quiet of deep thought with all of us. There was but little talk and that little was composed of a few attempts by some to express their true feelings. They ended by stating feebly the equivalent of "I tell you, I'm glad I'm here." And the source of that feeling was that every one of them was answering the call, was doing his bit for his country in this time of need. We all felt it, but none can ever describe it. It was a thing too big and too deep for description.

As we landed at our European port many days later the same thrill caught us up and held us. There was no demonstration by great masses; only a very deep sense of satisfaction within every one of us. We were where we belonged.

FIRST LIEUT. ARTHUR E. GUEDEL,
*M. R. C., U. S. A.*

## TO OFFICERS OF THE MEDICAL RESERVE CORPS U. S. ARMY INACTIVE LIST.

Word received from the Surgeon General of the U. S. Army, conveys the information to officers of the Medical Reserve Corps of the United States Army, inactive list, that assignment to active duty may be delayed, and that they are advised to continue their civilian activities, pending receipt of orders. They will be given at least 15 days' notice when services are required.

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WALTER M. BRICKNER, M.D., F.A.C.S., Editor

NEW YORK, NOVEMBER, 1917.

## THE COUNTRY'S CALL ON THE PROFESSION.

Many thousand civil practitioners have responded to America's call and are now in active service in the army and navy. But the response is not yet by any means sufficient. The army is still about 10,000 short of the 24,000 estimated as needed. What is holding back the 10,000 men who should have volunteered and have not? Are you one of them? Why have many who have applied for and received commissions in the Medical Reserve Corps failed to accept them?

There can be no complaint of the physician who does not volunteer because of physical disability, obligations to his community that cannot be assumed by another, or family necessity not provided for by savings. There can be only scorn for the physician who holds back solely on the ground of self-interest or of fear.

Of the thousands with the colors is a large percentage of older men, with families and large expenses. They ought to be an example to the 10,000 that are wanting—men with no dependents, sufficient savings, and reputations that assure a resumption of practice; and the young men recently graduated from colleges and hospitals, also with no dependents and with little or no practice to forego.

*Those who can serve should.* Will the 10,000 answer that call or will they wait until Congress may decree that *those who can serve must!*

The physician who measures his country's need against his own indifference, fear or selfishness falls far indeed below the standards of citizenship, patriotism and medical tradition.—W. M. B.

## THE SENIOR MILITARY MEDICAL ASSOCIATION.

Physicians who, by reason of their age, physical defects or teaching obligations, are unable to join the Medical Reserve Corps, will nevertheless have opportunities for military service to their country through the recent commendable organization, with the approval of Surgeon General Gorgas, of the Senior Military Medical Association.

The purpose of the Association is to enroll physicians who can give part or whole-time military service in their home towns or elsewhere in this country.

As our share in the war develops there will probably be need for many such men (as "contract surgeons" or otherwise graded), to serve as consultants, specialists, etc., in home hospitals and in re-education institutions, in the examination of recruits and conscripts, in the physical or mental restitution of men rejected from the army or incapacitated by wounds, in laboratory researches, etc.

The venerable W. W. Keen, an army surgeon in the Civil War, is president of the Association; James M. Anders and John B. Deaver, also of Philadelphia, are vice-presidents. For the present, membership eligibility does not extend beyond Pennsylvania, New Jersey, Delaware and Maryland but branches will no doubt be established elsewhere. Application for admission to the association may be made to the Secretary, Dr. Alexis Dupont Smith, 5926 Greene St., Germantown, Pa.—W. M. B.

## THE DOCTOR'S CONTRIBUTION.

In this world's war, your service is absolutely essential.

The medical officer bears the same relative position in war as in peace in that he is a conservator of health and life.

Through his skill, thousands of men receiving slight casualties, are returned to the fighting force, thus conserving the physical strength of the army.

In Base, Field and Evacuation hospitals, doctors are as essential as in civil institutions, where the sick and injured are cared for.

As regimental surgeons and on transports and in the Sanitary Corps, must the Government have doctors if we are to terminate this war successfully.

Your contribution to your country at this critical

time is *your service* which you can give for the period of the war as an officer in the Medical Reserve Corps. That your country needs you, is best answered in that she is calling you *now*.

The fighting forces are constantly expanding and such expansion calls for additional doctors and even with the troops now in training and under mobilization (about two million) the Surgeon General has not enough doctors to fill the requirements.

Secure an application blank at once; fill it out and present it to your nearest Examining Board. Do not live to regret that you did not have a part in your country's great struggle for democracy which means *Liberty*.—MACD.

## SURGICAL LESSONS OF THE WAR.

A war lasting over three years and producing hundreds of thousands of wounded men for treatment has, of course, taught many valuable surgical lessons. It would appear thus far, however, that the knowledge gained has not been of any new principles, but rather of experiences in the applications of acknowledged principles. Thus there have come about useful and important modifications in the technic of plastics, in the treatment of fractures, especially the compound, and of amputations, and valuable observations concerning the management of perforating wounds of the thorax, the abdomen and the central nervous system.

The biggest thing, perhaps the only big thing, surgically, that has thus far come out of the war has been the management of wound infections—a vast and pressing problem that was quite inconspicuous in the South African, the Russo-Japanese and even the more recent Balkan wars.

From the outset the study of antiseptics became of great importance and the older ones, and several new ones, were critically observed both clinically and in the laboratory. Some of these have been retained and are more or less actively in use in the military hospitals. Wright's method of wound treatment by hypertonic salt solution has also been tried out, but reports would indicate that it does not find great support. The antiseptic that appears to be most successful, Dakin's solution of sodium hypochlorite, is also not generally employed abroad, but as the Carrel-Dakin method is coming to be better understood and Carrel's technic is being learned, this means of combating wound infection is gradually growing in use and bids fair to being adopted as a standard procedure. From all reports, it gives far better results than any other method. Thus, Depage at La Panne is reported by Gibson to have shown him 80 compound fractures treated by the Carrel-Dakin method, all of them free from suppuration. The warmest supporters of Carrel's technic are those who have mastered the details.

It is in these minutiae and, especially, in the difficulties that attend the proper preparation of the Dakin solution, that the method has its greatest objections. To prepare the sodium hypochlorite solution, of proper strength and reaction, from "chloride of lime" required a skilled chemist to titrate various samples of each can of the bleaching powder, and much mixing, settling, filtering and again titrating. Now, however, that the solution can be made, accurately, quickly and very cheaply, from liquid chlorine and sodium bicarbonate—the chlorine escaping through a meter into a simple solution of sodium bicarbonate—the preparation of the fluid loses all of its terrors and most of its errors. The Carrel-Dakin method of treating wound infections is the most important contribution of military to civil surgery that has come from this war, thus far.

That an apparently clean granulating wound, once suppurating, can often be successfully closed is, of course, not a new observation, but the adoption of this as a routine procedure based, not on gross appearance alone, but on the determination of the number of bacteria in smears from the wound secretions, is new and is another lesson learned from Carrel—the economic importance of which needs no argument. We have also learned from him and his associates that an apparently clean, granulating surface wound will not heal in the shortest time if treated, as we usually treat such wounds, merely aseptically. To secure maximum healing the bacterial growth must be restrained, antiseptically, as by the employment of chloramine (chlorazene) paste. Carrel and his co-workers at the Rockefeller Institute, notably du Noüy, have published in various numbers of the *Journal of Experimental Medicine*, 1916, and 1917, their interesting observations on wound cicatrization, and quite striking and fascinating is the method by which du Noüy plots the curve of cicatrization with which he can predict the date of final healing; and it is equally interesting to note how a rise in the bacterial content of a cicatrizating wound at once disturbs the curve!

Important details in the technic of skin and fat grafting are also gifts to us from the wizard of surgery, Alexis Carrel, and the brilliant, painstaking men who are working with him.

From the side of pure laboratory investigation, the development of an antitoxin for the gas bacillus infection (bac. Welchü), seems at present to be the greatest accomplishment stimulated by the war. This antitoxin, produced by Carroll G. Bull and

Miss Ida W. Pritchett, of the Rockefeller Institute, (*Journal of Experimental Medicine,* July, 1917), has not yet, as far as we know, been tried out on the battlefield; but animal tests and some observations on human beings indicate that it works with a biochemical accuracy that may well be spoken of as "mathematical."

The extent of shell and shrapnel injuries and, especially, their rapid development of severe infections, has demonstrated the need, in most cases, of very early operative treatment, a highly important consideration also in penetrating abdominal wounds. It has thus come about that these cases are not delayed until they can reach the base hospitals but are operated upon within a few hours of the firing line at what, in the American army, would be called "evacuation hospitals" and what the British call "casualty clearing stations." This is a decided change in procedure. It leaves much for the base hospitals to do in reparative surgical work, but injuries that, in previous wars, could have waited for transportation to base hospitals, must now by reason of threatening infection, be handled radically as soon as possible.—W. M. B.

## COURT PLASTER.

In the midst of the numerous hysterical seizures regarding the existence of pro-German activities, it is not unnatural to have various types of crime attributed to pro-German sources. The discovery that some court plaster contained tetanus bacilli naturally gave rise to a fear that these contaminations were intentional and designed to infect and destroy the users of court of plaster.

It is re-assuring to find in *Public Health Reports,* September 7, 1917 that no evidence exists that court plaster has been deliberately contaminated. Of fourteen specimens examined from various local pharmacies, two revealed the presence of the tetanus organism. In all probability, had the bacteriological investigation involved the use of a larger number of specimens or indeed larger areas of the same specimens, the number of positive results would have been increased.

While interesting laboratory questions are involved to determine the source of the infection, whether the cause lies in the use of infected ingredients or in careless handling after manufacture, the fact remains that court plaster can not be regarded as surgically clean. Inasmuch as the use of court plaster in surgery is exceedingly small and practically no casualties have been reported resulting from its use there need be little fear concerning this new discovery of uncleanliness and contamination.—I. S. W.

# Surgical Sociology

**Ira S. Wile, M.D., Department Editor.**

## A VAGUE LAW.

Legislation seeking to protect the public from exploitation by charlatans is wholly desirable. It is unfortunate, however, when legislative enactments designed to protect the public actually result in conditions which may be to its detriment.

The New York State law which prohibits advertisements concerning venereal disease and symptoms referring to the genital organs appears to work against the public interest if a strict interpretation of the law is accepted. While advertising of venereal diseases is termed a misdemeanor punishable by fine or imprisonment or both "This section," it is stated, "shall not apply to didactic or scientific treatises which do not advertise or call attention to any person or persons from whom or any office or place at which information, treatment or advice may be obtained, nor shall it apply to advertisements or notices issued by an incorporated hospital or a licensed dispensary or by a municipal board or Department of Health or by the Department of Health of the State of New York."

In all probability the courts would not construe this law as applying to a genito-urinary surgeon who places his title after his name over or under an article published in a scientific journal. One might ask what is the legal status of medical publications dealing with urology or surgery if they publish articles dealing with varicocele, impotency or spermatorrhea in which reference is made to drugs or medical procedures helpful in the treatment of these conditions. The mere fact of publication implies the capability of the writer to treat such conditions and thus would appear to constitute indirectly an advertisement contrary to the intent of the law.

Health departments, hospitals and dispensaries are privileged to announce the names of capable practitioners who would seem to be otherwise restricted in asserting themselves to be capable of giving treatment or advice to sufferers from the venereal diseases and certain other sexual disabilities.

In the opinion of Attorney General Lewis: "The other exception to the general prohibition, permitting incorporated hospitals and licensed dispensaries to publish advertisements shows clearly that it is not the intent of the statute to prevent incorporated hospitals or licensed dispensaries from advertising. This being so, it clearly would not be a violation of

the spirit of the law if, after his signature to a scientific or didactic treatise the author should put the address of an incorporated hospital or a licensed dispensary with a statement of his position in that institution."

In a rigid interpretation of the law, judging from the paragraph quoted, it does not prevent the publication of medical journals, monographs, or books which discuss drugs and medicines, providing that there is no direct reference to persons by whom such drugs or medicines are employed and whose services might be secured for active remedial treatment. If, however, the publication of drug advertisements in scientific journals is actually prohibited under the present wording of the law, a manifest error has crept into the law which should be corrected by amendment at the next meeting of the legislature. As a matter of fact the limitation is clearly designed to prevent pseudo-scientific articles to be substituted for the ordinary forms of quack advertisements.

It is difficult to believe that it was the purpose of the legislature to check legitimate publications or to prohibit accurate scientific advertisements under the guise of an attempt at regulating quackery. Such an endeavor would be contrary to the spirit and interests of medicine, surgery, and social welfare. The legitimate advertisement of recognized drugs is not fraught with danger, but represents a normal and natural method of bringing to the attention of the profession the virtues of the ever increasing number of drugs which research and investigation have developed in the interest of public health. The mere fact that such substances as protargol, argyrol, potassium permanganate, silver nitrate, copaiba and sandal oil and hyoscine are employed against genito-urinary affections does not operate against making their usefulness, their merits or demerits known to the medical profession in normal and legitimate channels of publication.

# Book Reviews

**A Treatise on Regional Surgery.** By various authors. Edited by JOHN FAIRBAIRN BINNE, A.M., C.M., F.A.C.S., Kansas City, Mo. In three volumes, *Volume I.* Octavo; 652 pages; 351 illustrations. Philadelphia: P. BLAKISTON'S SON & Co., 1917. $7.00, net.

This is the first of the three volumes which make up this treatise and describe the surgical affections of the head, neck and thorax with the exception of those of the chest wall, lungs and pleura. Many men are associated in this work and among them are famous surgeons.

The subject matter is discussed in a series of different articles all of which, having been written independently, exhibit a marked diversity of arrangement and manner of description. The arrangement of these in an anatomical order gives the only semblance of a connected discussion. Much repetition has resulted.

The worth of the various articles is variable. A few are indifferent; some are excellent, notably so the chapters devoted to the ductless glands of the neck, and to the heart and pericardium. The chapter on the larynx and trachea gives a minimum to actual disease and a maximum to the art of bronchoscopy, the discussion of the latter seeming to dominate everything. Too much space is given to some conditions (carotid body tumors) which one meets but rarely. No discussions are given of the general principles of the large subjects of fractures and dislocations; nor of such entities as tuberculosis or syphilis.

The style of the many chapters is for the most part short and choppy and the profusion with which the subject matter is arranged in tabular form, gives one the feeling that the book would be welcome to the medical student who is "cramming" for an examination. For the most part, therefore, the discussions are inadequate for the serious student or practitioner.

Finally much is wanting in that allusions to the newer laboratory diagnostic methods are few and far between.

The make-up of the book is pleasing. The paper is good, the type large and easy to read. The illustrations are numerous, well made and when needful have been colored to give the reader a truer concept of the subject portrayed.

**Fractures of the Lower Extremity or Base of the Radius.** By LEWIS STEPHEN PILCHER, A.M., M.D., LL.D., Brooklyn, New York. Consulting Surgeon, Bushwick, German, Jewish, St. John's and Bethany Deaconess Hospitals, and New York Skin and Cancer Hospital; Editor of *The Annals of Surgery.* Duodecimo; 116 pages; 132 illustrations. Philadelphia and London: J. B. LIPPINCOTT COMPANY, 1917. $2.00.

This little book is a reprint of the article which appeared in the January number of the *Annals of Surgery.* It gives the accumulated experience of many years and in addition discusses at length the mechanism and pathology of these fractures in the light of this experience. The name of Colles is purposely omitted from the discussion because "the use of the name in question has been associated with erroneous views of the nature and cause of the injury."

The forces producing the fracture are discussed in relation to the anatomy of the wrist and the nature of the resulting deformity is indicated. These and the lines of fracture are profusely illustrated by many excellent drawings and skiagrams.

Treatment is discussed in detail and it is pointed out that with proper methods a splint is not necessary. The usual fault seen is that immobilization is kept up for too long a time. When the fracture heals with deformity it is not always necessary to interfere because frequently motion and power return practically to normal.

**The Roentgen Diagnosis of Diseases of the Alimentary Canal.** By RUSSELL D. CARMAN, M.D., Head of Section on Roentgenology, Division of Medicine, Mayo Clinic; and ALBERT MILLER, M.D., First Assistant in Roentgenology at the Mayo Clinic. Octavo; 558 pages; 504 original illustrations. Philadelphia and London: W. B. SAUNDERS COMPANY, 1917. $6.00 net.

Carman's contributions to the Roentgen diagnosis of the gastro-intestinal tract are always instructive. His description in this book of the lesions as demonstrated by the roentgen ray, together with the illustrations and reports of individual cases, and the operative findings are so carefully detailed, that every student can readily follow the technic.

The authors do not agree with the findings of Case, Cole, Caldwell, Phahler, etc., as to the percentage of Gall-stone demonstrations on the plate. At the Mayo Clinic this percentage is greater than is usually assumed by the general surgeon, who still remembers the 5 per cent. which were found a few years ago.

The illustrations are unusually numerous, varied, and excellently reproduced. The type is clear, easily read, and the paper is of good quality, giving contrast to the

cuts. The book is of value to every surgeon as well as to those following the study and practice of roentgenology.

**Roentgen Technic.** By NORMAN C. PRINCE, M.D., Attending roentgenologist to the Omaha Free Dental Dispensary for Children; Associate Roentgenologist to the Douglas Hospital, etc. Octavo; 140 pages; 71 original illustrations. St. Louis: C. V. MOSBY Co., 1917.

This book consists largely of illustrations of the positions and exposures necessary for roentgenizing all parts of the body. Attached to each illustration is a description of the time and technic required. We can recommend this book to every beginner in the practice of roentgenology; and to those physicians who operate an apparatus for their own practice.

**A Treatise on Orthopedic Surgery.** By ROYAL WHITMAN, M.D., M.R.C.S. Eng., F.A.C.S., Assistant Professor of Orthopedic Surgery, Columbia University; Professor of Orthopedic Surgery, N. Y. Polyclinic; Associate Surgeon, Hospital for the Ruptured and Crippled, New York; etc., etc. *Fifth Edition.* Octavo; 906 pages; 704 illustrations. Philadelphia and New York: LEA AND FEBIGER, 1917. $6.50.

Orthopedic surgery has been gradually broadening in scope so that, in the practice of many orthopedists, it may be said to cover all the affections of the skeletal tissues including injuries to and infections of the bones and joints, effections of the muscles and of the peripheral nerves. Intensive studies in orthopedics have, too, been much stimulated by the recent epidemic of poliomyelitis in this country and by the many crippling injuries of war abroad. The prevention of deformities has thus come to the fore as one of the great tasks of the orthopedist.

Whitman evidently had these developments in mind in preparing the fifth edition of his standard book. Certainly it is a great improvement on the fourth edition which appeared in 1910. Much of the work has been re-written and all of it has been carefully revised. One hundred or more new illustrations are included and the general appearance of the book is much improved. Its size, however, has not been increased. It is still essentially a text-book for the student, the general practitioner and the general surgeon rather than a reference work for the specialist.

**Diseases of the Skin.** By RICHARD L. SUTTON, M.D., Professor of Diseases of the Skin, University of Kansas; Dermatologist to the Christian Church Hospital, Kansas City; etc. *Second Edition.* Octavo; 1021 pages; 833 illustrations and 8 colored plates. St. Louis: C. V. MOSBY Co., 1917. $6.50.

Professor Sutton's work has been well received. It is but about a year since the first edition appeared. This second edition is larger and contains a great many new illustrations—140, to be exact. Indeed, the pictorial feature of the book—so important in a work on dermatology—deserves much praise, no less for the profusion of photographs, than for their selection and their reproduction. Another feature of value is the selection of references at the end of each section.

The book has been enlarged by about 100 pages and the more important literature of 1916 has been included. Three new sections have been introduced, viz., on gangrenous balanitis, atrophy of the mucous membranes of the tongue and mouth, and atrophy of the fatty layer of the skin.

**An Introduction to the History of Medicine.** With medical chronology, suggestions for study and bibliographic data. By FIELDING H. GARRISON, A.B., M.D., Principal Assistant Librarian, Surgeon General's office, Washington, D. C. Octavo; 904 pages; illustrated. *Second edition.* Revised and enlarged. Philadelphia and London: W. B. SAUNDERS Co., 1917.

The second edition of Dr. Garrison's book arouses anew the enthusiasm we expressed when reviewing the first edition. As a mere compilation of facts the book alone astonishes by its amazing accuracy. We have read large sections of this book with a keenly critical eye and with the exception of one or two instances, we have not found an error of either commission or of omission. The erudition and research involved in writing this history, seems more the result of a lifetime than a matter of a few years. When, in addition, we find our facts so beautifully and logically marshalled, a critique and a sense of historical values there are almost infallible, a delicious characterization and a literary style unequalled among medical men in this country, we can readily perceive why this book has been received with such profound approbation. We repeat that Garrison's book work is one of which American medicine may well be proud.

**Handbook of Gynecology.** For students and practitioners. By HENRY FOSTER LEWIS, A.B., M.D., Professor and Head of Department of Obstetrics and Gynecology in Loyola University School of Medicine; Chief of Obstetric Staff of Cook County Hospital; Fellow and ex-President of the Chicago Gynecological Society, etc., etc.; and ALFRED DE ROULET, B.Sc., M.S., M.D., Professor of Gynecology in Loyola University School of Medicine; Attending Gynecologist to the House of the Good Shepherd, and to St. Bernard's Hospital; Obstetrician and Chief of Staff of St. Margaret's Home and Hospital. Octavo; 445 pages; 177 illustrations. St. Louis: C. V. MOSBY Co., 1917.

This handbook of gynecology by Lewis and Roulet is a well written, very readable volume introducing the third and fourth year medical student into the domain of gynecology. Its one outstanding departure is not its brevity of detail but rather the logical arrangement and classification according to the lines of pathology. The preface, however, is full of statements calculated to win prospective student purchasers of the book, but nevertheless open to so much challenge by gynecologists that it would lead too far afield to compare prefatory promises with unrealized textual fulfilment. It is to be hoped that a further edition of the book will record a proper appreciation of the subject treated by the authors, namely that gynecology far from being a "lesser subject than medicine, surgery or obstetrics" is in reality all three combined and a part of each and that therefore it deserves "the attention and time and energy of the student" as an integral and important part of his course in medical study.

**Bone and Joint Studies.** I. By LEONARD W. ELY, Assistant Professor of Surgery (orthopedics), and JOHN FRANCIS COWAN, Assistant Professor of Surgery, Leland Stanford Medical School, Stanford University, California. PUBLISHED BY THE UNIVERSITY, 1916.

This monograph contains the following studies: Experimental Infection of the Dog's Knee Joint (Ely and Cowan). Reaction of the Tissues of the Rabbit to Injury (Ely and Cowan). Regeneration of Bone Marrow (Ely). A Study of 100 Dry Bones sawn in the laboratory (Ely), and a Study of the Sterno-Clavicular Joint (Ely). Space forbids us to mention all of the interesting and far-reaching data that these studies reveal; we content ourselves with recording some of the more important. It was found that if the cartilage is removed from the surface of a joint it will eventually regenerate, and that this regeneration is mostly formed by the synovial membrane. This newly-formed cartilage has much the same appearance as that found in "arthritis deformans." If the marrow is removed from the shaft of the tibia of the rabbit, it will quickly regenerate without any trace of the operation.

These studies are models of their kinds. It is a pity that so little of this kind of work is done by orthopedists.

**Animal Micrology.** Practical Exercises in Zoölogical Micro-technic. By MICHAEL F. GUYER, M.D., Professor of Zoology in the University of Wisconsin, President (1916) of the American Microscopical Society, with a chapter on drawing by ELIZABETH A. SMITH, Ph. D., Instructor in Zoology in the University of Wisconsin. *Revised Edition.* Octavo; 289 pages; illustrated. Chicago: The UNIVERSITY OF CHICAGO PRESS, 1917.

While primarily intended for zoological students, this book is eminently fitted for medical purposes. It covers the entire range of microscopic technic; fixing, section cutting (paraffin, celloidin, freezing, all varieties of staining, including blood and bacteria; embryological methods;

reconstruction of objects from sections; drawing and the use of the microscope. The book is full of valuable formulæ and hints. The book compares favorably with many of the standard works used by medical men, although it lacks some of the methods employed for demonstrating certain pathological lesions.

**Obstetrics.** A Text Book for the Use of Students and Practitioners. By J. WHITRIDGE WILLIAMS, Professor of Obstetrics, Johns Hopkins University; Obstetrician-in-Chief to the Johns Hopkins Hospital, Baltimore, Md. *Fourth Edition.* Octavo; 1029 pages; 702 illustrations. New York and London: D. APPLETON & Co., 1917.

Professor Williams in the fourth edition of his classic contribution to American medical literature has added the advances of the last five years. The book is too well known to require additional reviewing and comment. Suffice it to say that it has its peer in only two or three other volumes on obstetrics by American or English authors, and that specialists value it as much as and perhaps more than those whom the book is calculated to serve.

**Physical Chemistry of Vital Phenomena** for Students and Investigators in the Biological and Medical Sciences. By J. F. MCCLENDON, Assistant Professor of Physiology in the University of Minnesota. Duodecimo; 240 pages; illustrated. PRINCETON UNIVERSITY PRESS, 1917. $2.00.

This book comprises a course of lectures and laboratory work given to students. The aim of this volume is not to dwell upon physical chemistry but to show that the subjects treated can serve as a tool for physiological research.

Each chapter is well written and considers more or less one type of physical or chemical phenomena. The chapter on osmotic pressure is presented clearly, chapter VII on enzymes contains new data; the chapters on anesthesia and narcosis, on cytolysis and disinfection, on blood and cell media have a pointed interest for medical men.

The entire volume holds a great deal of information and knowledge. Everything is brought up to date as far as possible. The book has also a comprehensive literature list on the subjects discussed and an index to this literature.

**Common Diseases of the Male Urethra.** By FRANK KIDD, M.B., B.C. (Cantab.), F.R.C.S. Eng., Assistant Surgeon, London Hospital, etc. Duodecimo; 132 pages; illustrated. New York: LONGMANS, GREEN & Co., 1917. $1.75.

This compact volume is based upon a course of lectures delivered at the London Hospital. It aims mainly to present many years of patient, observant study of the gonococcus as it lives and thrives in the human urethra. The author's interests are clinical.

The book contains six lectures, all but the last dealing with etiology, diagnosis, technique for examination, treatment of urethrites. Lecture five considers the urethroscope; lecture six is on the clinical pathology of urethritis by Dr. Philip Painton.

There are also four appendices each one containing many points of value and interest. Of particular note is appendix II which presents the evidence tendered to the Royal Commission on venereal disease.

**The Treatment of War Wounds.** By W. W. KEEN, M.D., LL.D., Emeritus Professor of Surgery, Jefferson Medical College, Philadelphia. Duodecimo; 169 pages; illustrated. Philadelphia and London: W. B. SAUNDERS Co., 1917. $1.75.

Professor Keen, army surgeon in the Civil War, has prepared this small manual at the request of the National Research Manual. It is based on an analysis of many import articles, published in the past two years, on experiences with the newer antiseptics and with Wright's hypertonic salt solution, on the treatment of various types of war wounds, regionally considered, and on the transportation and general management of the wounded. To this are added abstracts of letters, secured for the purpose, from competent observers in military hospitals—Blake, Bowlby, Cabot, Crile, Cushing, Gibson, Lyle, and Murphy.

The manual is very useful both as a summary of established procedures and as a reference to important publications.

# Progress in Surgery

## A Résumé of Recent Literature.

**Pain in the Arm: Subdeltoid (Subacromial) Bursitis: A Further Study of Its Cinical Types, Pathology and Treatment.** WALTER M. BRICKNER, New York. *Journal of the American Medical Association,* October 13, 1917.

BRICKNER, says that brachial neuritis is a real condition but a comparatively rare one, and when well established it should be marked by motor, trophic or sensory signs as well as by nerve tenderness. Careful examination should be made to determine whether the neuritis is not simulated or caused by something else. Pain in the left arm may be associated with an anginal condition (tobacco poisoning, among other things) as well as with such surgical conditons as cervical rib, fracture of the greater tuberosity of the humerus, spontaneously reduced luxation of the shoulder, subluxation of the shoulder which may be due to apparently inadequate causes in some cases, mild sprain of the shoulder, periostitis, neoplastic and inflammatory bone diseases, and chronic bone abscess. But far more common than any of these is subdeltoid (subacromial) bursitis, the immediate cause of which the author believes to be traumatic even when a history cannot be obtained. Concerning the commonly, but not always associated subbursal deposit of lime and other mineral salts in or on the supraspinatus (occasionally the infraspinatus) tendon, he believes that this deposit of salts is due to trauma and some metabolic predisposition, also that the disease is neither infectious nor toxic in its origin. The deposits, he finds, are always under the bursa, not in the cavity nor in its walls. There are always adhesions between the two walls of the bursa in the cases he has operated. He emphasizes the fact that the lime deposit takes place not gradually, but very speedily after the injury, and in some cases it is slowly absorbed, while in others it may persist for years. This also suggests some biochemical influence. Pain, and disability in shoulder movements are the principal symptoms, though the latter may be absent in chronic cases. Very often, but not always, the pain is referred to the shoulder as well as the upper arm and may radiate into the forearm, the hand or the neck. In the early stage there may be some slight swelling, due to serous effusion. In most cases, when the patient presents himself there is no swelling. The only tender point the author has constantly found is anteriorly over the lesser tuberosity. Roentgenography is important, but if it shows nothing it is not against the diagnosis of bursitis. He would divide the varieties into acute, hyperacute, chronic, and chronic with exacerbations. The hyperacute refers more particularly to the severity of the symptoms. In acute cases pain and stiffness develop rapidly and reach their maximum in about three days. Chronic subdeltoid bursitis begins in the acute form or is of the same severity throughout, existing for months and years but usually subsiding with or without treatment. The chronic form with exacerbations is explained by the name. Brickner has little confidence in electricity, baking, violet ray, or internal medication, but treats his cases usually by a simple automatic abduction method. The patient is put to bed, supported on several pillows, and his arm is raised as far as he can comfortably abduct it. A towel or bandage sling is passed from the wrist or elbow to the head of the bed, which is raised on blocks or chairs. As he gradually slides down in bed the arm goes up; and it is no rare experience in a patient who has not abducted his arm more than 45 degrees in many months to find it fully and painlessly abducted in two or three days, or even one day. If the patient cannot sleep with his arm in the sling this gradual traction may be made intermittent. When passive abduction is thus obtained, active abduction follows with exercise. As some patients, however, do not recover with this treatment, the author advises operation in cases of the chronic form with exacerbations and in the acute, hyperacute and chronic cases in which this automatic abduction fails. The operation he employs includes the processes of splitting the

deltoid, raising the outer wall of the bursa from the inner one and incising it, dividing all adhesions, incising and retracting the floor of the bursa, removing the deposit if extratendinous, or incising the tendon to remove it, suturing tears in the tendons, suturing the inner and the outer wall of the bursa. The reconstruction of the bursal walls is not essential, nor is abducting the arm in plaster of Paris for about a week, but these measures are mentioned as advisable.

**Gunshot Wounds of the Knee Joint.** J. CAMPBELL and H. F. WOOLFENDEN, *Lancet*, August 11, 1917.

This study is based upon the observation upon 60 cases. The three fundamentals in the treatment of wounds of the knee joint are these: 1. Absolute rest, 2. Perfect asepsis, 3. The use of Carrel's method of wound treatment. Rest is best obtained by the use of the Thomas splint. The Carrel method is employed either through the original wound or wounds, or if the infection is severe through various drainage openings. In making drainage of the knee joints the author insists that posterior incision through the popliteal space is always necessary.

If foreign bodies are present, they should be removed if large, from the joint or if evidence of sepsis is present. If the foreign body is small, is lodged in the bone, or is not attended by signs of sepsis it may be left alone. If it later gives trouble it can be removed. The authors do not approve of excision as a method of treating the sepsis. Of the 60 cases, only 2 died and in only one was amputation necessary.

**The Nailing Operation in Ununited Fractures of the Femoral Neck.** PAUL P. SWEET. *The American Journal of Orthopedic Surgery*, July, 1917.

Ununited fractures of the femur neck are not infrequently due to faulty treatment. This is true mainly for intracapsular fractures and particularly in elderly patients in whom the general conditions forbids prolonged or overnice manipulation of the parts involved. Whitman's method of abdiction serves the excellent purpose of favoring fibrous union in these old and ofttimes debilitated people, yet in some instances this procedure can yield a good result and for these cases Swett suggests nailing of the separated fragments. There must be bony opposition of these fragments and complete immobilization; these ends are attained by nailing. This nail method is not meant to replace the Albee method of autogenous bone peg but it may serve as a very vailable procedure when a more time consuming technique may not be advisable.

**Cholecystostomy Versus Cholecytectomy.** MILES F. PORTER, Fort Wayne, Ind. *Journal of the American Medical Association*, August 18, 1917.

The gallbladder has an important function in all animals whose digestion may be said to be intermittent rather than remittent and continuous. Its removal or obliteration in man and animals leads to dilatation of the bile ducts, and the effect on the pancreas of the increased pressure of the bile within the ducts has been amply demonstrated. Deaver says that the gallbladder has important functions to perform, of which the chief are to equalize the pressure of bile in the ducts and to secrete mucus which shall dilute the bile. With all the facts we cannot accept Moyniham's dictum that the gallbladder has no useful purpose whatever. If one could say postively in what proportion of cases the gall bladder is the principal or sole cause of gallbladder disease, we could see much more clearly to a decision between cholecytostomy and cholecystectomy. Authorities are quoted by Porter as to the bad effects of infection from the bile passages in pancreatic disease and also as regards the effects of the two operations respectively. There are those who believe that cholecystectomy is the operation of election for gallstone disease, while on the other hand those like Ochsner and Deaver, who maintain that cholecystotomy is the operation of choice, and still others of equal experience and skill who take the middle course. One is forced to the conclusion, therefore, that the difference is accounted for by the different pathologic conditions that are met. The danger of overlooking stones in the common duct should be constantly borne in mind. A stone in the common duct with the gallbladder retained is not so great a menace as a stone in the common duct after a cholecystectomy. The important question to decide is whether in a given case surgical treatment is called for at all, and if so what particular kind of surgical procedure suits the case.

**A Consideration of the Causes of Recurrent Symptoms After Operation for Gastric and Duodenal Ulcer.** ABRAHAM O. WILENSKY. *The American Journal of the Medical Sciences*, September, 1917.

Wilensky points out that the surgical treatment of gastric or duodenal ulcer does not end with the dismissal of the patient from the hospital when his wound has healed. Instead it should be followed by a continued period of after-treatment over many months. These patients have had associated lesions in the ulcer-bearing are as well as the ulcer itself and these lesions may produce post-operative symptoms even when the ulcer is removed.

The most frequent symptoms are due to functional disturbances—vomiting, pain, pyrosis and gaseous eructations appear and they may all be controlled by proper diet and systematic gastric lavage. Also disturbances of the stomach, acidity, post-operative atony of the abdominal viscera causing constipation, post-operative changes in the gastric and intestinal juices providing diarrhea—all these factors require treatment and regulation.

In addition there are symptoms due to anatomical disturbances following operation. Faulty suture work, or cutting through unabsorbable sutures may cause symptoms of pain. Finally there is a group of patients in which symptoms are due to anatomical changes in the neighboring tissues. Thus, for example, herniae in abdominal scars may simulate stomach ulcer pain; intra-abdominal adhesions or lesions in the spinal canal may make it difficult indeed to distinguish the pain from true gastric ulcer pain.

The recurrent ulcer may be responsible for persistent post-operative symptoms; however it is essential to exclude definitely all other conditions which may produce the clinical picture of pain, vomiting, eructations, etc.

**Incompetency of the Ileocecal Valve vs. Lane's Kink as a Cause of Ideal Stasis.** J. H. KELLOGG, Battle Creek, *Medical Record*, September 8, 1917.

As the result of the X-ray studies of Case and the results obtained by operation, Kellogg believes that the cause of ileac stasis lies in an incompetency of the ileo-cecal valve rather than to the kink discovered by Lane. He believes that the Lane kink is nothing but an embryonic structure and without significance. The various other membranes and adhesions found in the ileo-cecal region are probably due to a localized slow peritonitis due to the stasis in the ileum. Kellogg says that the evidences of incompetency are found at operation by his being able to force gas by pressure from the cecum into the ileum. In such cases as a rule, the terminal portion of the ileum is found to be distended to twice or more the usual diameter; furthermore it is thickened. It must be remembered that the cause of the incompetency is some obstruction lower down in the colon, usually adhesions of the pelvic or ileac colon. Sometimes, a neoplasm is found or a tubercular or syphilitic ulceration. Short circuiting of the bowel as practiced by Lane is usually attended by a recurrence of the symptoms. On the other hand, Kellogg's operation, consisting in restoration of the ileo-cecal valve and removal of the distal obstruction is attended by complete cure.

**Local Anesthesia in Sixty Operations for Acute and Chronic Appendicitis.** JOSEPH WIENER, New York, *New York Medical Journal*, August 25, 1917.

Of the 60 cases, 41 were chronic and 19 acute. Wiener uses a 1% solution of novocaine to which some adrenalin is added. This is first injected into the skin, then into the deeper tissues. After dividing the skin and subcutaneous tissues more solution is injected into the internal oblique and aponeurosis of the external oblique muscles. These are then split with the knife (McBurney incision).

The peritoneum is then injected and opened. Before removing the appendix a little solution is injected into the mesenteriolum so that the pain usually attended in dividing this structure is abolished. No packings are used whatever. The closure of the structures is not attended by pain. Wiener says that his patients do not suffer nearly as much with distention as when a general anesthesia is employed; also the nausea and vomiting is less; they require less opiates, and convalescence is much hastened. There was no mortality in these 60 cases.

**The Silent Common Duct Stone.** DANIEL N. EISENDRATH. *Medicine & Surgery*, July, 1917.

Eisendrath emphasizes the fact that calculi may be present in the hepatic or common bile ducts with no clinical or palpatory evidence. He quotes Kehr's indications for opening the common duct even though palpation be negative. These indications are: (1) if the pancreatic head is enlarged or thickened, (2) if the common duct is dilated or thickened, (3) if there is a history of jaundice, chills, fever, (4) if the gall bladder contains many small stones.

Following these rules Eisendrath incised the common and hepatic ducts in 36 cases in which palpation were negative; in 12 cases calculi were found on exploration and the author therefor feels that Kehr's advice is valuable, Eisendrath claims particular importance for (2), (3), and (4) as indicators and to these he adds another, viz., recurrence of pains or symptoms of cholangitis after operations such as drainage or removal of gall bladder.

**The Endocrine Function of the Pancreas and Its Relation to the Sex Life of Women.** A. J. CARLSON. *Surgery, Gynecology & Obstetrics*, Sept., 1917.

The pancreas exerts the specific function from all evidence at hand, of secreting a substance into the blood for the utilization of sugar by the tissues. In the absence of the pancreas the power of the tissues to oxidize sugar is lost, and the hypo, or hyperfunction of the other endocrine glands which have the faculty of altering the sugar mobilization (adrenals, thyroid) cannot replace that specific sugar function.

Other conditions as acidosis, lipaemia, increased metabolism are probably also dependent upon pancreas function. True diabetes mellitus in man is primarily the result of pancreatic deficiency. There is at present no organotherapy of diabetes, experimental or clinical.

No specific relation between the pancreas as an endocrine gland and the gonads male or female has so far been established. Absolute diabetes probably renders conception impossible, while if induced after conception leads to death of the foetus. Partial diabetes under dietary control permits of normal sex life of women (menstruation, normal pregnancy, normal child, lactation), and pregnancy under such conditions does not aggravate the diabetes. But in the absence of such dietary control the condition of pregnancy aggravates the diabetes in the mother, and uncontrolled diabetes in the mother is extremely injurious to the foetus. There is some evidence that in late stages of pregnancy the foetal pancreas may function for the mother.

**Transplantation and Retention of Various Tissue after Hysterectomy.** WILLIAM P. GRAVES. *Surgery, Gynecology & Obstetrics*, Sept. 1917.

Specific surgical menopause symptoms consist chiefly of vasomotor disturbances in the form of hot flushes. After extripation of the uterus, vasomotor disturbances ensue with approximately equal frequency, whether the ovaries be retained *in situ*, totally ablated, or transplanted. Retention of ovarian tissue after hysterectomy is of little or no physiological value and may be productive of serious harm to the patient. Theoretically the menopause vasomotor symptoms are due to a break in the utero-ovarian functional harmony, by which the physiological balance of the glands of internal secretion is upset with consequent dysfunctional activity.

**Uteroscopy versus Transperitoneal Hysterotomy.** ALFRED HEINEBERG, Philadelphia. *American Journal of Obstetrics*, August, 1917.

Uteroscopy according to the author is superior to the transperitoneal hysterotomy in that it affords a perfect view of the interior of the uterus without subjecting the patient to the dangers attendant upon the invasion of the peritoneal cavity. It may be performed quickly under nitrous oxide-oxygen anesthesia. No more pain or discomfort is experienced by the patient than after an ordinary dilatation or curettage; it also affords a clear view of the cervical canal as well as of the uterine cavity.

**Hemostasis by Interposition of Muscle, Fat and Fascia in Parenchymatous Organs.** EDWARD H. RISLEY, *Surgery, Gynecology and Obstetrics*, January, 1917.

From his experiments on dogs, Risley has come to the conclusion that in bleeding from parenchymatous organs as liver and kidney, which is otherwise not readily controlled, the interposition of a piece of voluntary muscle will effect quick hemostasis. The further effect is fibrous union of the wounded organ. The piece of muscle tissue is best taken from the patient's own body at time of the operation. It should preferrably be joggedly cut by a knife and not crushed as with scissors, cut so as to ensure the pouring out of blood platelets and plasma. No salt solution should be used, as it interferes with the hemostatic properties of the muscle tissue. Fascia and fat also act as hemostatics, but to a limited degree. These tissues must always be sewn in, while muscle need only be inserted with gauze pressure; fine .00 catgut sutures may insure permanent interposition.

**Some Principles of Plastic Surgery.** J. L. AYWARD, *Lancet*, September 1, 1917.

Ayward emphasizes three points: 1. That the skin incision instead of being perpendicular to the surface should be oblique. 2. The importance of mobilizing the subcutaneous fat beneath the incision so that there shall be no subsequent depression. This is done by peeling the fat away from the subjacent tissues so that its only blood supply shall come from the skin vessels. 3. The use of mattress sutures in order that there shall be a broader apposition of their surface. Michel clamps accomplish the same end but are not applicable on the face.

**Some Statistical Results of the Treatment of Chest Wounds.** T. R. ELLIOTT, *Lancet*. September 8, 1917.

1. A sterile hemothorax of moderate size, that is, of about 30 oz., will recover as rapidly by natural absorption as by aspiration.

2. The retention of foreign bodies in the chest in aseptic cases does not appear to exert any crippling effect for military service, but more accurate information is urgently needed on this point.

3. Cases of infected hemothorax that have been drained in France and transferred to the United Kingdom generally recover rapidly and completely. None die, and subsequent operations are rarely needed. More than one-half of these empyema cases can be returned to duty.

4. The late mortality from chest wounds is practically nil in England, and it is only 5 per cent on the lines of communication in France; but in the area of the armies it is higher than was at first supposed. About 10 to 15 per cent may die in medical units at an early date from the severity of the injury and about 10 per cent may die later at the casualty clearing station from complicating sepsis.

5. Among those casualties which develop sepsis within the chest the mortality is very high, rising to nearly 50 per cent under the present system of treatment by rib resection and drainage.

6. The old conservative routine of surgical non-intervention, except by late drainage, finds its justification only in the satisfactory recovery of those cases of gunshot wound of the chest which remain non-infected—that is, about 75 per cent. The high mortality in those which develop sepsis demands a wider practice of the new prophylactic method of cleansing operations, performed at an early hour on certain carefully chosen groups of cases.